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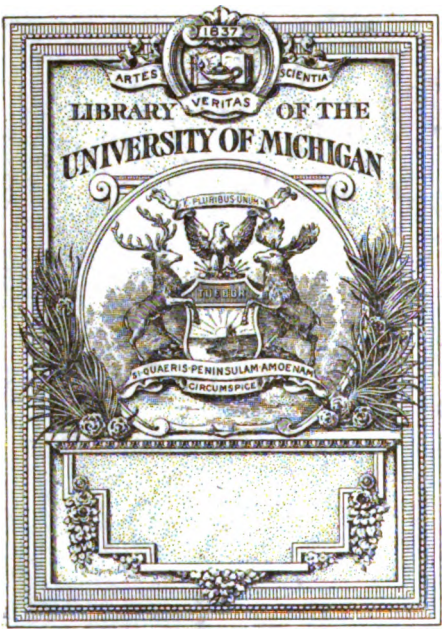

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EIGHTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

AND

VITAL STATISTICS

OF THE

COMMONWEALTH OF PENNSYLVANIA.

Transmitted to the Governor December 5, 1892.

HARRISBURG:
EDWIN K. MEYERS, STATE PRINTER.
1893.

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Resolution of the Board relative to papers published in its Annual Report passed July 2, 1885.

Resolved, That no papers shall be published in the annual report of this Board except such as are approved for the purposes of such publication by a majority of the members of the Board, and that any such paper shall be published over the signature of the writer, who shall be considered as entitled to the credit of its production, as well as responsible for the statement of facts reported and the opinions expressed therein.

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COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
EXECUTIVE OFFICE 1532 PINE STREET,
PHILADELPHIA, *December 5, 1892.*

To His Excellency ROBERT E. PATTISON, *Governor:*

SIR: In compliance with the provisions of section ten of the "Act to establish a State Board of Health for the better protection of life and health, and to prevent the spread of contagious and infectious diseases in this commonwealth," approved June 3, 1885, I have the honor to transmit the Eighth Annual Report of the Board for the year ending November, 1892.

BENJAMIN LEE,
Secretary.

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STATE BOARD OF HEALTH

AND

VITAL STATISTICS

OF THE

COMMONWEALTH OF PENNSYLVANIA,

1892.

OFFICERS AND MEMBERS.

PRESIDENT.

HON. SAMUEL T. DAVIS, M. D., Lancaster.

SECRETARY.

BENJAMIN LEE, M. D., Philadelphia.

MEMBERS.

PEMBERTON DUDLEY, M. D., Philadelphia.
JOSEPH F. EDWARDS, M. D., Philadelphia.
J. H. McCLELLAND, M. D., Pittsburgh.
HOWARD MURPHY, C. E., Philadelphia.
GEORGE G. GROFF, M. D., Lewisburg.
HON. SAMUEL T. DAVIS, M. D., Lancaster.
BENJAMIN LEE, M. D., Philadelphia.

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PLACE OF MEETING.

Supreme Court Room, State Capitol, Harrisburg (unless otherwise ordered).

TIME OF MEETING.

Second Thursday in May, July and November, at 4 p. m.

STANDING COMMITTEES.

1. Executive Committee.

PEMBERTON DUDLEY, M. D., chairman.
HOWARD MURPHY, C. E.
JOSEPH F. EDWARDS, M. D.
BENJAMIN LEE, M. D., secretary.

2. Committee on Registration and Vital Statistics.

J. H. McCLELLAND, M. D.
BENJAMIN LEE, M. D.

Bureau of Registration of Vital Statistics.—Department of Internal Affairs, State Capitol, Harrisburg.
State Superintendent of Registration of Vital Statistics.—Benjamin Lee, M. D.
Registrars of Marriage.—All clerks of Orphans' courts.
Registrars of Practitioners of Medicine and Surgery.—All prothonotaries.

3. Committee on Preventable Diseases, Disinfection, and Supervision of Travel and Traffic.

JOSEPH F. EDWARDS, M. D.
PEMBERTON DUDLEY, M. D.

4. Committee on Water Supply, Drainage, Sewerage, Topography and Mines.

HOWARD MURPHY, C. E.
GEORGE G. GROFF, M. D.

5. Committee on Public Institutions and School Hygiene.

GEORGE G. GROFF, M. D.
J. H. McCLELLAND, M. D.

6. Committee on Adulterations, Poisons, Explosives and other Special Sources of Danger to Life and Limb.

PEMBERTON DUDLEY, M. D.
HOWARD MURPHY, C. E.

7. Committee on Sanitary Legislation, Rules and Regulations.

SAMUEL T. DAVIS, M. D.
PEMBERTON DUDLEY, M. D.

The President is a member *ex-officio*, of all committees.

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PART I.

REPORT AND MINUTES.

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REPORT OF THE SECRETARY.

STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH OF PENNSYLVANIA.

Hon. SAMUEL T. DAVIS, M. D., *President of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania*:

SIR: I have the honor to submit the following report of the work of the Board and of my official acts during the past year. The Board has held three regular and eight special meetings.

The regular meetings took place on November 12, 1891, May 13, 1892, and July 11, 1892. The special meetings were held on February 22, March 28, June 29, August 13, September 3, September 16, September 21 and September 22, 1892.

At the first of the regular meetings, held November 12, 1891, a communication was received from the trustees of the University of Pennsylvania, announcing the approaching opening of its new

LABORATORY OF HYGIENE.

Whereupon the following resolution was adopted:

Resolved, That this Board has received, with sincere satisfaction, the formal announcement of the approaching opening of the Laboratory of Hygiene, of the University of Pennsylvania, considering that this event marks an era in the progress, not of science only, but of civilization, in this State.

Resolved, That the Secretary be instructed to communicate with Dr. William Pepper, Provost of the University, and with Dr. J. S. Billings, Director of the Laboratory of Hygiene, suggesting a conference for the purpose of formulating a plan by which this Board may avail itself practically of the facilities to be afforded by the Laboratory for the investigation of diseases, and of the means for its prevention, for the analysis of foods, water and other beverages, and for bacteriological studies.

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Resolved, That in a definite co-operation between the University and the State Board of Health in the prosecution of such researches, this Board recognizes an opportunity, not only for mutual aid, but for advantage of the greatest moment to the entire Commonwealth.

In accordance with the above resolution such a conference was held, and your secretary was requested to take part in the opening exercises of the institute, which took place on the 22d of February, and which were formerly attended by the Board, called in special session for the purpose.

The necessity of a laboratory of hygiene to the State Board of Health has been urgently felt, and arises out of the duties imposed upon the latter by section five of the act of assembly establishing it, which reads as follows:

"The State Board of Health and Vital Statistics shall have the general supervision of the health and lives of the citizens of the Commonwealth, and shall especially study its vital statistics. It shall make sanitary investigations and inquiries respecting the causes of disease, and especially epidemic diseases, including those of domestic animals, the sources of mortality, and the effects of localities, employment, conditions, habits, food, beverage and medicine on the health of the people. It shall also disseminate information upon these and similar subjects among the people. It shall, when required by the Governor or the legislature, and at such other times as it deems important, institute sanitary inspections of public institutions or places throughout the State."

Now, to carry out in any adequate degree the purposes of the law with regard to investigating the causes of disease, and the effects of foods, beverages and medicines on the health of the people, two things, among others, are absolutely essential: first, that the Board should have means and opportunities for making or procuring chemical analyses; and, secondly, that it should have means and opportunities for prosecuting what are now known as bacteriological examinations—the study of the germs of disease. And it goes without saying that where the interests of the health and lives of five million people are concerned, these means and opportunities should be on a generous scale, and should conform to the most recent developments of scientific hygienic research, both in this country and in Europe. It does not at all meet the intention and requirements of the statute, that the secretary of the Board should spend a few cents on test-tubes and chemicals, or press his old Dolland microscope, handed down from a previous generation, into the service of the State. Nor is it fitting that this great Commonwealth, with its millions of revenue, should be depending, as it has done, on the charity of private chemists, who have, in a spirit of generous patriotism, placed their services at the disposal of the Board in order to enable it, in some slight degree, to meet the claims that are constantly and prop-

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erly made upon it for the analyses of suspected waters and foods. It is hoped, therefore, that the trustees will see their way clear to allowing the Board to refer applications of this kind to the laboratory for investigation. The Board, for its part, should make every effort to obtain from the legislature a reasonable appropriation for such purposes, distinct from its general appropriation, which will enable it to meet, at least, the cost of all work done for the State.

Further, section nine, of the act creating the Board, instructs it, "from time to time, to engage suitable persons to render sanitary service, or to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto." Observe the phrases: "suitable persons," "expert skill." Heretofore the Board has been compelled to call to its aid for these objects simply medical men, intelligent, educated, sound practitioners, but without that special training and equipment which would render them "suitable persons" in any strict, technical construction of the expression, or would furnish them with "expert skill." Here, again, the laboratory will prove the right hand of the Board, giving just that instruction which a sanitary inspector needs to fit him for his special work. And, on its side, it should be the purpose of the Board to pursue more persistently, even, than it has in the past, its purpose of obtaining a thorough sanitary organization of the State under legislative sanction and compulsion, the result of which will be to create a constantly increasing demand for just such trained, practical sanitarians as this school will graduate. In this view of the case it might be the part of wisdom for the trustees to place a certain number of scholarships at the disposal of the Board.

Finally, it is desirable that publicity should be given to the important work which will be carried on in this Institute, which your secretary risks nothing in saying, after a careful inspection, and after comparison with other similar laboratories, will be in advance of any in this country and the peer of any abroad,—it is highly desirable that this work should be frequently brought to the notice of the legislature, the medical profession and the public; and I, therefore, suggest that its director be requested to present a stated report quarterly, or at such other intervals as may be deemed expedient, to the State Board of Health, of all investigations here prosecuted directly in the interest of the public health, which report shall form a portion of the Annual Report of the Board, to be transmitted to the Governor, and of which a certain number of reprints shall be furnished to the trustees for general distribution, as well as for preservation in the archives and various libraries of the university.

EPIDEMIC AND CONTAGIOUS DISEASES.

During the year there has been rather an unusual prevalence of preventable diseases. Small-pox has appeared at several points but has

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been carefully isolated either by the State Board or by local boards, and thus prevented from becoming epidemic. Scarlet fever has been unusually prevalent, but of a mild type. Diphtheria, however, has been widespread and extremely fatal. It is safe to say, comparing the mortality returns of our cities with those of previous years, that this disease has been at least five times more prevalent than ever before. During the past weeks in the city of Philadelphia, it has reached at least ten times its average death rate. It is evident that the only way to deal with this virulent contagium, is to adopt the same rigid restrictions with regard to isolation, disinfection and destruction of fomites that we have long insisted on for repression of small-pox.

The manner in which the board deals with that disease in rural districts, which are unfortunately denied the protection of local health authorities of any kind, is fairly illustrated in the management of an outbreak of

SMALL-POX AT POINT PLEASANT.

Small-having been reported at Point Pleasant, Bucks county, on the 15th of November, 1891, Prof. Wm. B. Atkinson, M. D., medical inspector for the Delaware district, was at once dispatched to make an investigation. Under instructions from the secretary, he placarded the house in which the disease existed, called a public meeting of the residents and with the assistance of Dr. A. M. Cooper, a resident physician, appointed sanitary, quarantine and finance committees. Day and night guards were established, and Dr. A. M. Cooper was commissioned by the Secretary, Deputy Medical Inspector of the Tinicum sub-district, including the townships of Tinicum, Badminster, Plumstead, Buckingham and Soleberry, with full authority to inspect and enforce quarantine. Dr. Alexander, of the Lancaster County Vaccine Farm, was notified to send two hundred points of virus to Dr. Cooper and other physicians in the neighborhood.

The disease was confined to the first case, an Italian who had come from Trenton, N. J., and an infant in the same house. The authorities of Doylestown were communicated with and recommended to urge the citizens to have vaccination performed.

The chairman of the directors of the poor of the county was notified that it was their duty to provide for the necessary expenses of nursing and quarantine, and should new cases occur, to have them quarantined in the county pesthouse.

The following is the letter of instructions to the Medical Inspector:

Dr. WILLIAM B. ATKINSON,

Medical Inspector Delaware District.

SIR: In making your inspection at Point Pleasant your first step will be to see Dr. Cooper, if possible, then to visit the house and placard it after verifying the diagnosis. The more influential citizens should then

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be assembled, and sanitary, finance and quarantine committees appointed. The sanitary committee will have charge of cleaning up and disinfecting throughout the town, and of vaccination. The State Board of Health will furnish virus, but can assume no other expenses. The quarantine committee will appoint day and night guards, and must allow no one to go in or out of the infected house except the physicians. They will provide food and medicine at the expense of the village if the family of the patient or patients cannot afford it, for all quarantined persons who will make known their needs through a selected spokesman by word of mouth, no letter or other piece of paper being allowed to pass outside the lines. A vacant house should be selected, to which those exposed in the infected house, but not sick, can be removed for observation, only those necessary for the care of the patient remaining. Persons thus under observation should be detained (18) days. In case of one of them being taken sick with this disease, or any other persons in the village being so taken sick, such person must be removed to the house in which the present case now is, which will be the quarantine hospital. If, however, there is a small-pox hospital connected with the county almshouse, it is the duty of the directors of the poor to have all new cases removed to that building and properly cared for at the expense of the county. All persons known to have been exposed to the contagion must be vaccinated first, and later the entire population.

The finance committee will proceed at once to raise funds to meet the necessary expenses. If an additional case occurs it will be necessary to procure a nurse. The physician will make no unnecessary visits within the lines, but will keep himself constantly informed by verbal communication with the nurse of the condition of the patient. After leaving the house he will make a complete change in his clothing and take a disinfectant bath before visiting any other patient.

The circular of the Board on precautions against small-pox should be placed in every family by the sanitary committee. Until the quarantine committee have selected the guards, you are authorized to assign the duty of watching the house to the town constable. The guards will wear the badge of the State Board of Health, and are authorized to arrest and return to the house any person or persons endeavoring to escape therefrom, and to use such force as may be necessary to accomplish this object. You will inform yourself of the distance of all neighboring towns and villages, and of the frequency of communication between them and Point Pleasant. You will immediately report to this office, upon your return, the number of persons sick, the probable number exposed, the number of inmates of the infected house, the population of the village, the names of railroads passing through or near it, and the number of persons vaccinated up to the present time.

(Signed) BENJAMIN LEE,
Secretary.

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SMALL-POX AT MORRISVILLE.

Request was received from the burgess of Morrisville, Bucks county, for the assistance of the Board in dealing with a case of small-pox in that borough, November 25, 1891. The inspection was made by Medical Inspector Atkinson. He found the house already placarded by order of the burgess, a professional nurse engaged, a guard posted and vaccination being thoroughly performed. Instructions were sent to the burgess as to the enforcement of precautions in detail, and also with regard to the steps to be taken should other cases occur. Fortunately this was not the case, as there was no further development of the disease. It may be stated that the individual who was the cause of so much annoyance and expense, although doing business in Trenton and aware of the prevalence of small-pox, had stubbornly refused to be vaccinated. It is unfortunate that there is no law inflicting heavy penalties on such criminal stupidity. It was a pleasure to the secretary to find a burgess so thoroughly alive to the responsibility resting upon him and so intelligent in its discharge.

SMALL-POX AT CLARKE'S VALLEY.

On the 24th of March small-pox was reported at Clarke's Valley, Schuylkill county, Dr. W. Murray Weidman, medical inspector of the Schuylkill district, was at once instructed to investigate, and to enforce stringent precautions if the report was found correct. He verified the diagnosis of the attending physician, Dr. E. Phillips, of Tower City, and the patient and exposed persons were isolated at the cottage where the outbreak occurred. Five cases of confluent small-pox occurred in this family, three of which proved fatal. The disease was stamped out, and the cottage thoroughly cleansed and fumigated. The wise precaution was taken of killing a cat and dog which had been exposed to the infection, as the contagion of this and other communicable diseases often clings to the hair and fur of animals retaining its vitality for a long time.

SMALL-POX AT COUDERSPORT, POTTER COUNTY.

In the case of an outbreak of this disease at Coudersport in consequence of the absence, illness, or urgent professional engagements of several of the medical inspectors, considerable difficulty had been experienced by the Secretary in obtaining the services of an inspector. Ultimately Dr. J. R. Thompson, medical inspector of the Allegheny district, was secured. He reported that owing to an opinion expressed by one of the resident physicians there had been doubt as to whether the cases were true small-pox or not. He found seven cases of discrete small-pox, confined to two families. One case proved fatal. The disease originated in a Polish family named Pallaskie, six of the cases having developed from the first fatal one. The patients were removed

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and isolated in a pesthouse, and every precaution as to disinfecting the houses, boiling and burning of clothing, taken. No further cases resulted.

The thanks of the Board are due to Dr. Thompson for thus going into a district at a considerable distance from his own at great personal inconvenience and to the detriment of his professional interests. The knowledge of the fact that a physician has exposed himself to any contagion, but especially that of variola, on the part of his patients, always creates a feeling of uneasiness, and may temporarily seriously interfere with his practice. The Secretary would suggest the propriety in such cases of assigning increased compensation to the medical inspectors.

SMALL-POX AT TITUSVILLE.

Small-pox occurred at Titusville, Crawford county, in the person of an immigrant child, who had arrived at the port of New York two weeks previously in the steamer "Diana." The presumption was very strong that the infection had been brought in the baggage. The Secretary, therefore, communicated with the health officer of the port of New York, at which the vessel had entered, transmitting a resolution of the Board requesting increased care in the disinfection of the baggage and personal effects of all immigrants landing from steamers on which contagious diseases had existed during the voyage.

DIPHTHERIA.

Although, as already stated, diphtheria has been widely disseminated throughout the State, its most general and fatal prevalence has been in the cities of Erie and Philadelphia.

DIPHTHERIA AT ERIE.

On the 6th of January the Secretary received the following telegram from Dr. A. A. Woods, health officer of Erie, medical inspector of the Lake District: "Telegraph power to close schools here; diphtheria epidemic; come if I telegraph to-morrow; explanation in post." To this the Secretary replied: "Close such schools as you consider necessary to check epidemic of diphtheria." At the same time the Secretary wrote Dr. Woods advising a conference between himself and the school directors, and that he should endeavor to persuade them, in view of the facts which he could lay before them, to themselves take this step.

On the 13th of January the following telegram was received from Dr. Woods: "Total cases reported since September, 195. Deaths—October, 10; November, 11; December, 25; January, 15; week ending December 19, 7; week ending December 26, 9; weeks ending January 2 and 12, 8 each. Eleven new cases reported January 10, 11 and 12, all in new houses. Have twenty-eight houses placarded, containing forty-four cases. I proposed to committee to close buildings having pupils sick;

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they refused. Papers condemn the school board; majority of papers support me. Lawyer advises peremptory mandamus; court will grant."

As a result of Dr. Woods' wise and energetic action and untiring devotion, the epidemic began to decline rapidly, and public opinion was so thoroughly aroused that the attendance on schools, from which cases appeared to originate, almost entirely ceased. In a few weeks, however, the public began to relax their precautions and the epidemic was relighted. On receiving a second urgent request from Dr. Woods, the Secretary issued a peremptory order for the closure of both public, and private schoots. This was complied with, and the epidemic at once began to abate.

Dr. Woods' management of this serious epidemic cannot be too highly commended. The department of public education being a distinct branch of the State government, having plenary powers of its own, it will readily be seen that the State Board of Health should endeavor, wherever it is possible, to exert its influence for the control of epidemics rather by acting as an advisory body to that department than by asserting its own authority, which it undoubtedly possesses. Inasmuch, however, as the exercise of such authority, in order to be of service to the community to save life, should be prompt, and as the authority of the Secretary to issue such an order in the interval between meetings of the Board was, in this instance, called in question, and lives were thus sacrificed to a legal quibble, the Board instructed the Secretary to draw up a regulation which should prevent such factious opposition in the future. Such regulation is hereby respectfully submitted:

REGULATION VI.

Whenever the Secretary shall have satisfactory information that any of the following diseases, viz: Small pox, varioloid, scarlet fever, diphtheria, yellow fever, typhus fever or Asiatic cholera is epidemic, or threatens to become epidemic, in any city, borough, district or place having no local Board of Health, or in which the sanitary laws or regulations are inoperative, he shall have authority, as executive officer of the Board, to issue a proclamation in the name of the Board, declaring such disease epidemic and to order and enforce such measures in the way of quarantine, isolation of the sick, vaccination, disinfection, and the closure of schools, public and private, religious and secular, as in his judgment may be necessary to stamp out the infection.

DIPHTHERIA IN PHILADELPHIA.

The Board of Health of this city and its indefatigable health officer, Major Moses Veale, finding that new cases of diphtheria were constantly occurring, owing to intercourse between the occupants of infected houses and their neighbors, resolved to enforce domiciliary quarantine in its strictest sense. Every house in which the disease exists is

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strictly guarded and neither ingress nor egress is allowed. The effect of this judicious measure is already noticeable.

REGULATION FORBIDDING THE TRANSPORTATION OF BODIES DEAD OF DIPHTHERIA.

In consideration of the increasing prevalence of diphtheria, and the large mortality from it, the Board has considered it expedient to modify its regulation regarding the transportation of dead bodies in such a way as to forbid entirely the transportation of the bodies of those who have died from that disease. Notice of such modification has been sent to all local boards of health and to all railroad companies in Pennsylvania and to the boards of health of other states. The leading railroad companies have issued circulars embodying this prohibition :

MEASURES TO PREVENT THE SPREAD OF TYPHUS FEVER.

The almost total disappearance of typhus fever (ship fever, famine fever) from our shores in the last fifteen or twenty years speaks volumes for the efforts of sanitarians and philanthropists in improving the hygienic conditions of the steerage of our ocean steamers. Something must be allowed also for the diminution of the period of detention on ship board owing to the increased speed of vessels. The sudden outbreak of true typhus among a colony of Jews recently arrived in the city of New York, from the famine stricken districts of Russia, in the early part of the present year was a genuine surprise. The health authorities of that city were however equal to the emergency and soon had every case isolated, as well as those who had been exposed to the infection. Through the courtesy of the Secretary of the State Board of Health of New York, the names and special destinations of every individual immigrant ticketed to a point in Pennsylvania, who had been a passenger on the "Massilia," the vessel which brought the disease, were furnished to your Secretary. He in turn telegraphed this information to the authorities of the several towns, with instructions to keep the individuals under observation for a short period. Within a week he had received information that each one had been located. The fever appeared only in two places, Pittsburg and Philadelphia, and was promptly checked.

MEASURES OF DEFENSE AGAINST THE INVASION OF ASIATIC CHOLERA.

At the meeting of the Board in July, 1890, your Secretary called attention to the gradual spread of cholera along the shores of the Mediterranean, and to the resultant duty on the part of all municipal authorities in the State to immediately put their cities and towns into such a condition of cleanliness that should the disease reach this country, the germs would find no congenial soil in which to develop. He at the same time suggested the passage of a resolution calling upon the Board of Health of the city of Philadelphia, to temporarily prohibit the importation of rags from Spanish ports. Although the disease disap-

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peared almost entirely from Spain, it steadily made its way westward overland from Asia until in the beginning of the present year, the situation began to be threatening.

On the 21st day of May, in anticipation of its early arrival in this country, circular No. 7 (Revised) on precautions against cholera and other choleraic diseases was sent to more than three hundred prominent daily papers throughout the State. This was conceived to be the most effective mode of reaching both the health authorities and the people. On the 7th day of July the Secretary visited the quarantine station of Boston, and on the 9th, that of New York, and conferred with the authorities of those stations as to the means to be adopted to place them in a great state of efficiency. At the meeting of the Board on the 11th day of July, he reported the prevalence of cholera at numerous points in Europe, and asked the sense of the Board as to the expediency of issuing a special circular in addition to the regular circular just alluded to, calling upon the people throughout the State to take the necessary precautions against the introduction and spread of the disease. The Board did not immediately order the preparation of such a circular, but requested the Secretary to take such action whenever in his opinion it should become imperative.

Immediately on receiving intelligence of the prevalence of cholera in Hamburg, doubting the capacity of the station at Lazaretto, to care for any large number of suspects and patients, he wrote to Dr. William H. Ford, president of the board of health of Philadelphia, and Major Moses Veale, health officer, advising that all vessels from European ports be detained at the United States Marine Hospital Service quarantine station, Delaware Breakwater, for examination.

On the 26th of August he telegraphed Dr. Walter Wyman, Supervising Surgeon General of the United States Marine Hospital Service, as follows:

"The State Board of Health of Pennsylvania considers that you would be justified in including arrivals from all European ports in your order on the 18th instant."

The following is the text of the order referred to:

TREASURY DEPARTMENT,
OFFICE SUPERVISING SURGEON GENERAL MARINE HOSPITAL SERVICE,
WASHINGTON, D. C., *August 17, 1892.*

To Collectors of Customs, Medical Officers of the United States Marine Hospital Service, Agents of Foreign Steamship Lines, Local Quarantine Officers, and others whom it may concern:

The act approved April 27, 1878, entitled "An act to prevent the introduction of contagious or infectious diseases into the United States;" provides that no vessel coming from any foreign port or country where any contagious or infectious disease exists, or any vessel or vehicle conveying persons, merchandise, or animals affected with any contagious

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disease, shall enter any port of the United States, or pass the boundary line between the United States and any foreign country, except in such manner as may be prescribed under said act.

Furthermore, section 4,792 of the Revised Statutes of the United States provides as follows:

"The quarantine and other restraints established by the health laws of any State respecting any vessels arriving in or bound to any port or district thereof shall be duly observed by the officer of the customs revenue of the United States, by masters and crews of the several revenue cutters, * * and all such officers of the United States shall faithfully aid in the execution of such quarantine and health laws, * * * * and as they shall be directed from time to time by the Secretary of the Treasury.

Official information having been received of an epidemic of cholera in Russia, and in view of the large immigration into the United States from said country, and of the danger that exists of the introduction of cholera into the United States through the medium of personal effects and baggage of said immigrants, it is hereby ordered that on and after September 18, 1892, no vessel having on board personal baggage, bedding, clothing, etc., belonging to immigrants from Russia, or having on board personal effects, baggage, etc., belonging to any immigrant coming from any cholera infected district shall be admitted to entry into the United States unless accompanied by a certificate from the consular officer at the port of embarkation to the effect that said personal effects, baggage, etc., have been disinfected in accordance with the methods hereinafter described.

For the disinfection of said articles one or more of the following methods will be used, all articles to be unpacked and freely disposed for disinfection:

1. Boiling in water not less than one hour.

2. Exposure to steam not less than one hour, the steam to be of a temperature not less than 100 degrees centigrade (212 degrees Fahrenheit) nor greater than 115 degrees centigrade (239 degrees Fahrenheit) and unmixed with air.

3 Solution of carbolic acid of a 2 per cent. strength.

This method (No. 3) may be applied only to leather goods, such as trunks, satchels, boots, shoes; to rubber goods, etc., the articles to be saturated with the solution.

WALTER WYMAN,
Supervising Surgeon-General, U. S. Marine Hospital Service.

Approved:
O. L. SPAULDING, *Acting Secretary.*

The above action was taken in compliance with a request from the Secretary of the State Board of Health of Illinois. On the 29th of August a request was received from the same officer that the Board

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should co-operate with their own in memoralizing the President to issue a proclamation suspending immigration until cholera should subside. This your Secretary hesitated to do for two reasons: First, because he doubted the legal power of the President to take this step; secondly, because he felt that any such recommendation should take the regular course through the Marine Hospital Service, to which the duty of enforcing quarantine is assigned by law.

The following telegram was therefore sent:

"Dr. WALTER WYMAN, *Supervising Surgeon General of the United States Marine Hospital Service, Washington, D. C:*

"In view of the cholera situation, the State Board of Health of Pennsylvania respectfully suggests that absolute prohibition of immigration from Europe during the present epidemic be enforced. If your department does not possess the power this Board will second you in petitioning the President to do so, and if necessary, to call Congress in extra session to authorize such action."

BENJAMIN LEE,
Secretary.

To this the following reply was received:

WASHINGTON, D. C., *September 1, 1892.*

"Dr. BENJAMIN LEE, *Secretary of State Board of Health of Pennsylvania:*

"Circular issued to-day. Have State Board of Health to declare twenty days' quarantine on all immigrant vessels. See circular in press dispatches.

"(Signed) WYMAN,
Surgeon General."

On the thirtieth day of August the following circular was sent to the State Printer, with instructions to print ten thousand copies with all possible haste, and also to print ten thousand additional copies of circular No. 7.

COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
EXECUTIVE OFFICE, 1532 PINE STREET,
PHILADELPHIA, *August 30, 1892.*

To all Health Officers, Boards of Health and Borough Councils in the Commonwealth of Pennsylvania:

Early in the present summer the State Board of Health, anticipating the westward spread of Asiatic cholera, sent to every prominent daily paper in the State its circular, recently revised, on precautions against cholera and the choleraic diseases. In many instances these papers had sufficient intelligence and patriotism to publish considerable extracts from this circular containing the most important points. In this way

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the information therein contained as to the steps necessary to be taken by municipal authorities to prevent the disease from getting a foothold in their communities, has been widely disseminated, and it is trusted that your honorable bodies have felt the importance of acting in accordance with it. The apprehensions of the Board have, in the meantime, been amply realized. The National, State and Municipal Quarantine authorities having put their respective stations in all possible readiness, are now momentarily expecting the arrival of cholera infected vessels.

The President and Secretary of the National Conference of State Boards of Health, together with the Secretary of the American Public Health Association, are at present inspecting the stations of the Dominion Government at the mouth of the St. Lawrence river, and should any deficiencies be found to exist in their equipment they will doubtless be remedied at their suggestion.

The Secretary of this Board has within the past few weeks carefully inspected the stations at Boston and New York, the principal ports of entry for emigrants, and found them better equipped to meet such an emergency than ever before. He has also conferred personally with the Surgeon-General of the United States Marine Hospital service, and with the health officer and the President of the Board of Health, of Philadelphia, with regard to the condition of the stations on the Delaware river and bay, and can assert that unusual and effective preparations have been made for the reception of infected vessels destined for ports on that stream.

It is your duty to supplement their vigilance by placing your towns in such a condition of cleanliness that should a few stray cases of the disease pass the coast cordons, its germs will find no congenial nests in which to develop. It is not enough that you should issue circulars conveying information to the public as to their duties, although this you should do frequently and fully. You should appoint special agents charged with the duty of visiting every house and inspecting it from garret to cellar, from front door to back gate.

The enclosed blanks for a "Sanitary Survey" will show you what matters should be especially inquired into. You would be wise to have similar blanks struck off, or you can obtain them at moderate expense, by applying to Prof. George G. Groff, Lewisburg, Pa. The result thus obtained will form a record of permanent value of the sanitary condition of your town, as they will indicate the places requiring at all times your special supervision. If you have not yet passed stringent regulations or ordinances with regard to cesspools, drains, pig-pens, slaughter houses, gutters and other similar nuisances, you should do so at once. A copy of "Model Ordinance" is enclosed as a guide for this purpose. All public supplies of drinking water should be carefully investigated, and so far as possible, in view of the unfortunate refusal of the legisla-

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ture to pass a law protecting them, guarded from pollution. Suspected wells should be analyzed.

The limited means at the disposal of this Board will not permit it to offer analyses free of expense, but it has made arrangements to have them made at reduced rates. All wells situated within two hundred feet of an uncemented cess-vault, or liable to receive surface drainage from privies, barn-yards, pig-pens, chicken-yards or house-drains, should be regarded with suspicion, and in the event of the presence of cholera in your town their use should be absolutely forbidden. Under the same circumstances nothing should be allowed to enter the mouth which has not been cooked, whether meat, vegetables, fruit, milk or water. It is unnecessary to repeat in detail the precautions which will be found in the accompanying circular, all of which are of importance. You have ample time for preparations, which will make your constituents, who look to you for protection, feel compararively safe and thus avert a panic, should the disease make its appearance.

By order of the Board.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.

On the third day of September, the Board met in extra session to consider the situation and adopt additional precautions. It was ordered that pending the printing of the circular to health and municipal authorities, it should be given as wide a circulation as possible through the public press.

The following order and regulations were adopted:

QUARANTINE OF PORTS OF ENTRY.

"In accordance with the proclamation of the President of the United States, and in compliance with the request of the Surgeon General of the United States Marine Hospital service in charge of the national system of quarantine, the State Board of Health of Pennsylvania, hereby orders that in view of the fact that Asiatic cholera prevails in many ports and States of Europe, including Great Britain, no vessel from cholera infected port shall be permitted to enter at any port in this State until such vessel shall have undergone a quarantine detention of twenty days.

"It is further ordered that no vessel as hereinbefore described shall be permitted to enter the waters of the Delaware river above the line dividing the State of Pennsylvania from the State of Delaware, without having been previously inspected by the officer in charge of the United States Marine Hospital Station, near the town of Lewes, in the State of Delaware, it being understood that such order is co-operative with and not in contravention of the orders of the Board of Health of the city of Philadelphia.

It is further ordered that no boat, tug, skiff or any other conveyance shall be permitted to land on the shores of any rivers or lake, or at any

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wharf or dock on the same from any such vessel, or to go to said shores from any such vessel, save and except those which are employed or authorized by legally constituted quarantine authorities.

All police officers and constables in townships bordering on waters into which such vessels may come are hereby enjoined to keep vigilant watch to prevent any such intercommunication."

This order shall take effect at once.

TO TRANSPORTATION COMPANIES.

In accordance with regulation III of this Board, which reads as follows:

"Regulation in regard to the sanitary supervision of travel and traffic.

Upon satisfactory information of the approach to or the transit through the Commonwealth of Pennsylvania, of infected persons or goods, it shall be the duty of the Secretary, as executive officer of the Board, to cause the same to be stopped at the State line, or, if found within the limits of the State, to cause such persons or goods to be removed from cars, stages, vessels, boats or other conveyances, and securely isolated and disinfected; and he may, if in his judgment the emergency is such as to demand it, call a meeting of the committee on travel and traffic, to which his action shall be submitted, with his reasons therefor, in writing. But in cases coming under the jurisdiction of national or municipal quarantine authorities, he shall co-operate with said authorities in all such actions.

Notice is hereby given to the officers of all transportation companies, whether by land or by water, that any transportation company shall be declared contraband of quarantine which shall introduce, land or transport within the borders of this Commonwealth of Pennsylvania any person suffering from Asiatic cholera or cholerine (so-called), or any person who shall develope said disease within four full days after having been so introduced, transported or landed within the borders of said Commonwealth by such company.

If a railroad company be thus declared contraband of quarantine, its trains shall be stopped at the State line, and held until inspected by an inspector of this Board and declared by him free from the danger of conveying the contagion of Asiatic cholera into this Commonwealth.

If a steamboat, canal, or other navigation company, its boats shall not be allowed to enter any dock, tie up at any wharf, or by any means land passengers, baggage or merchandise until it has undergone like inspection and been declared free from danger of introducing the said contagion into the Commonwealth of Pennsylvania.

To the Officers of Railroad and Steamboat Companies in Pennsylvania:

The principal railroad companies operating in this State have adopted admirable regulations for the sanitary care of their cars and premises under ordinary conditions. The State Board of Health has already

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taken occasion to commend these, as well as the readiness of these companies to co-operate with it in its efforts to protect the public health. In view, however, of the threatened invasion of Asiatic cholera, it is important to enforce these regulations with unusual strictness and to take certain additional precautions.

The Board, therefore, orders:

First. That all water closets and urinals in cars be provided with proper water-tight receptacles for retaining deposits instead of allowing them to fall upon the tracks and thus endanger water supplies; said receptacles to contain disinfectants, and to be renewed at certain intervals in such places and in such manner as may be determined upon for the most perfect protection against infection. The adoption of the precaution should be begun with second-class and immigrant cars.

Second. Should the discharge of the sick fall upon seats, floors or platforms of cars or stations, they should be first disinfected, and then removed in closed buckets, and the soiled places then disinfected and thoroughly cleaned.

Third. All cars coming from infected places shall be disinfected before sweeping, and the sweepings disinfected and burned.

Fourth. All water closets and urinals in steamboats and canal boats shall be provided with proper water-tight receptacles for retaining deposits instead of allowing them to fall into the water, which is in most instances the supply of drinking water for some center of population. Such receptacles shall always contain disinfectants, and shall be emptied at the end of each trip in such manner and in such place as may be designated by the local authorities.

Fifth. All accumulations of filthy clothing, and rags shall be at once disinfected and burned.

Sixth. Should cholera become epidemic the drinking water furnished for the use of passengers, should be boiled, and so far as possible should not be obtained from places in which the disease exists.

At the same meeting the following resolution was passed:—

Resolved, That the Secretary be instructed to represent to His Excellency the Governor of the State, the danger now threatening our population from cholera, the inability of the Board to appoint paid agents who may be necessary for purposes of railroad inspection and other precautionary measures, and to inquire of him whether any portion of the moneys in the State Treasury can be drawn upon to meet these exigencies.

At the same meeting the Secretary was instructed, on the appearance of cholera in any portion of the State not protected by sanitary authorities, to confer with the county authorities in regard to the furnishing of hospital accommodations and medical and nursing care, and to make application to the Adjutant General of the State for a sufficient number of tents for hospital purposes.

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The appointment of deputy inspectors at such points as circumstances might, in the judgment of the Secretary render necessary, to serve during the emergency without compensation, was also authorized. The day following this meeting, Sunday, September the fourth, the Secretary conferred with His Excellency the Governor, at Harrisburg, at the request of the latter, and laid before him the work of the Board. As a result of this interview His Excellency at once issued the following proclamation:

IN THE NAME AND BY AUTHORITY OF THE COMMONWEALTH OF PENNSYLVANIA.

Executive Department.

PROCLAMATION.

WHEREAS, Asiatic cholera is known to prevail in a virulent form in many foreign ports and countries, with which this country is in constant communication:

And Whereas, The President of the United States has considered it expedient to issue a proclamation declaring quarantine against this disease;

And Whereas, The State Board of Health of this Commonwealth has, in view of the facts above rehearsed, issued the following circulars and orders, to wit:

A circular of instructions to all health officers, board of health and borough councils, urging that unusual vigilance be exercised in carrying out all measures of sanitary precaution as set forth in circular No. 7 of said Board, entitled "Precautions against Cholera, Cholera Morbus, etc."

A notice to all officers of transportation companies, whether by land or water, to the effect that if such companies introduce cholera into the State they will be declared contraband of quarantine, and their conveyances subject to detention at the State line and inspection by an inspector of the Board.

A circular of instructions to officers and employes of railroad and navigation companies, indicating certain additional precautions necessary to be adopted in order to maintain their roadways, water-ways, conveyances and stations in a condition of cleanliness and purity; and an order declaring a quarantine of twenty days of all vessels coming from infected ports, at all ports of entry in this Commonwealth;

And Whereas, The local boards of health and municipal authorities of many cities and boroughs have issued circulars of information, and adopted stringent rules and regulations for placing their respective towns in the best possible sanitary conditions;

And Whereas, The history of all epidemics of this disease, and the accurate knowledge now possessed of the habits and mode of propagation of the germ which causes it, renders it absolutely certain that it cannot become epidemic in a community in which the laws of personal

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hygiene and scrupulous cleanliness of habitations, premises, streets and neighborhoods are carefully observed and enforced;

Now, therefore, I, Robert E. Pattison, Governor of the State of Pennsylvania, do recommend all authorities charged by law with the protection of the health and lives of their respective communities, whether boards or bureaus of health, health officers, health commissioners or borough councils, the utmost promptness and energy in placing their towns in a state of sanitary defense, in accordance with the instructions of the State Board of Health, and to the citizens of such towns that they not only yield cheerful obedience to the orders of such authorities, but lend their active aid in enforcing the same.

To the residents of villages and townships which are not provided by law with health authorities, that they voluntarily unite in appointing sanitary committees, composed of the most influential and intelligent members of the community, charged with the duty of making inspections, removing accumulations of filth, providing depots of disinfectants, and in all other known ways promoting sanitary conditions.

To physicians and others concerned in attendance on the sick, that they at once report any suspicious cases of which they may have knowledge to the local authorities or to the State Board of Health, without attempt at concealment, which is the surest means of spreading contagion; and to all transportation companies, that they at once comply with the instructions of the State Board of Health.

Given under my hand and the great seal of the State this fifth day of September, in the year of our Lord one thousand eight hundred and ninety-two, and of the Commonwealth the one hundred and seventeenth.

By the Governor.

[SEAL.] ROBERT E. PATTISON.

WILLIAM F. HARRITY,
Secretary of the Commonwealth.

The issue of this proclamation, together with the circular of the Board to local authorities, had a marked effect. In all incorporated towns, sanitary work was vigorously prosecuted. As soon as it was understood that deputy inspectors would be appointed for unincorporated villages and townships, requests began to pour in for such appointments, indicating that while the people were anxious to carry out the instructions thus given, they felt themselves powerless in the absence of some one with authority to direct their efforts and enforce precautions on the unwilling. Such appointments have been made to the number of thirty, covering points in every section of the State. In several instances, in view of the tendency of parties who have been guilty of maintaining nuisances in cities to remove the same to points directly outside the city limits, as well as the likelihood of accumulations of filth of all kinds to take place in such localities, it has been thought expedient to confer this authority upon the health officer or Secretary of the Board of Health of the city. The following circular defines the duties of such officers:

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DUTIES OF DEPUTY INSPECTORS, TO THE STATE BOARD OF HEALTH OF PENNSYLVANIA.

Deputy inspectors are appointed in order to meet the emergency now confronting this Board in view of the threatened invasion of cholera, and of the entire absence of local health officers in this State, outside the limits of large cities and towns. Their duties are, therefore, those ordinarily appertaining to the position of a local health officer, as follows:

First. Should any incorporated borough exist within the limits of their respective districts, to notify the burgess and council of such borough that they are by law responsible for the protection of the health of the people, and that failure to carry out the instructions of the State Board of Health recently issued, for placing their towns in the best possible sanitary condition, will render them liable to impeachment and prosecution as officers, and to a fine of one hundred dollars as individuals.

Second. In every village, to urge the residents thereof, to unite in mass meeting and appoint the following committees, viz: A finance committee, a sanitary committee and a quarantine committee. The finance committee to be charged with the duty of raising and disbursing funds; the sanitary committee with that of inspection, cleaning up, disinfecting and draining all streets, roads, alleys and commons, of inspecting private properties and insisting on similar steps being taken by their owners or occupants, and of establishing depots for disinfectants, and instructing the people in their use; and the quarantine committee, with that of inspecting all strangers arriving in the village, ascertaining whether they have come from infected places, keeping them under observation for five days, and, should signs of cholera appear among them, at once removing those attacked to some place already determined upon by the committee, and there keeping them in strict quarantine with day and night guards, until the deputy inspector and attending physician pronounce them free from the danger of conveying the infection. Acting in conjunction with the county commissioners and poor directors they shall provide medical and nursing care and food for all persons thus detained.

Third. To make frequent personal inspection of their respective subdistricts, and especially of all places of which complaint shall be made to them, and in case such places shall, in their opinion, be in such condition as to endanger the public health, to declare the same nuisances and to order their abatement in the name of the State Board of Health, without waiting for further instructions; and in case the parties so notified refuse to obey such orders within a reasonable number of hours, to report their names with a full statement of the facts of the case to the Secretary of this Board in order that the district attorney may be instructed to bring suit against the offenders in the name of the State.

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Fourth. To make frequent report in writing to the medical inspector of the Board for the district in which their sub-districts may be situated, of the general sanitary condition of the same, of nuisances needing abatement and of nuisances abated and work done, and to give the Secretary of the Board immediate notice by telegraph of the occurrence of any case presenting the symptoms of cholera within their jurisdiction.

Fifth. To make themselves familiar with the Model Ordinance of the Board, and its circular on cholera, to distribute the same among the people, and in every way to instruct them as to their duties in maintaining their homes in a cleanly condition and destroying all germ nests and plague spots in or near the same.

BENJ. LEE, M. D.,
Secretary and Executive Officer.

During the week following, the situation rapidly assumed greater gravity. Cholera infected vessels began to arrive; deaths took place in New York Harbor, the accommodations were evidently insufficient for the immense numbers detained under suspicion, cases of the disease appeared in the city of New York and public apprehension all over this State became intensely aroused. On the ninth day of September a conference was held at the office of the Board of Health of Philadelphia, between that Board, the State officials of the Port, your Secretary, and representatives of the principal railroads, to consider the situation, and devise means for fighting the disease. The measure of railroad inspection was considered, and met with cordial approval. The Secretary took occasion to call the attention of the railroad officials present to the Governor's proclamation, as supporting the orders of the Board already issued to them. At the request of the Secretary of the State Board of Health of Ohio, the Secretary met that officer and the Secretary of the West Virginia Board at Pittsburg, Sunday, September 11th, to consider the best means for preventing the spread of the disease through the medium of the railroads. As the mayor of that city had been in correspondence with the Secretary on the same subject, he invited him and such prominent officials as he might approve, to be present. The whole subject was thoroughly discussed, and it was decided that the readiest means of meeting the danger was the placing of medical inspectors on trains, the furnishing of each immigrant or other suspected passenger with a certificate by the inspection officer at the port of entry and the viseing of such certificate by the State Medical Inspector on crossing the State line. This of course meant the immediate outlay of money, and your Secretary was compelled to acknowledge that the Board had none beyond what was required for its current expenses. Before the close of the meeting a resolution was offered requesting the Governor to place the sum of fifty thousand dollars ($50,000.00) at the disposal of the State Board of Health to meet the existing emergency.

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While in Pittsburg, the Secretary in company with his honor, the mayor of Allegheny, made a brief inspection of the Allegheny river in the neighborhood of the intake of the water works of that city. The water was found subject to much pollution of a serious character, which coupled with its sluggish flow made it admirably adapted for the breeding of disease germs, and, in view of the possibility of its contamination with those of cholera, the Secretary deemed it his duty to address a letter to the mayor of the city, strongly urging the removal of the intake to a point higher up the river at the earliest possible day.

Returning to Harrisburg, the Secretary conferred with Mr. I. B. Brown, Deputy Secretary of Internal Affairs, with reference to the points on the State borders at which cholera would be most likely to be introduced by immigrants, and the stations or centres of population on both sides of the line nearest such points, and with the chief clerk of the Adjutant General's Department, as to the capacity and readiness of that department to furnish tents and camp equippage at a moment's notice. The following letter accompanied by circulars of instruction and the Governor's proclamation was sent to all railroad companies carrying passengers in the State.

COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
EXECUTIVE OFFICE, 1532 PINE STREET,
PHILADELPHIA, *1893.*

To the President and Board of Managers of the Company:

GENTLEMEN: Allow me to call your attention to the enclosed order and circular of the State Board of Health and to the proclamation of His Excellency the Governor of the Commonwealth endorsing them.

You cannot too promptly inaugurate measures for complying with them, as cholera may at any moment slip through the sanitary cordon on the coast. The pecuniary loss which you would suffer should it become epidemic would infinitely outweigh the trifling expense of taking the prescribed precautions. The Board looks confidently for the same hearty co-operation on your part with its efforts to protect the public health which it has enjoyed on previous occasions of less urgency and gravity.

I have the honor to be, gentlemen,
Yours with great respect,
(Signed) BENJAMIN LEE,
Secretary and Executive Officer.

September 5, 1892.

Replies to the above were received from the officers of the following companies, which embrace all the roads of any importance:

Western New York and Pennsylvania; Philadelphia and Reading; Allegheny Valley; Pennsylvania and North Western; Bangor and Portland; Baltimore and Ohio; Lake Shore and Michigan Southern; Lehigh Valley, and Pennsylvania.

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At the same time the following instructions were sent to all medical inspectors of the Board whose districts bordered on other states:

COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
EXECUTIVE OFFICE, 1532 PINE STREET,
PHILADELPHIA, *Sept.* *1892.*

To Medical Inspector, *District:*

DEAR DOCTOR: Within your district are the following points on the State border at or near which it may become expedient to establish inspection stations, hospitals and camps of observation, in consequence of the threatened invasion of cholera, viz: County, at which the railroad enters the State, and the nearest important station to which across the border is

You are hereby instructed to at once confer with the officers of said road with reference to the most available locations for such stations, the most convenient points for instituting inspections of passengers, and the number of medical train inspectors which will be needed in order to ensure the protection of the State and at the same time interfere as little as possible with the movement of trains and the convenience of the travelling public. In selecting points for camps, you should have regard to isolation, facilities for drainage and water supply. You will also nominate to the Board such physicians, of experience and good standing as in your judgment will be qualified to perform the duties of train inspectors.

Yours very truly,

(Signed) BENJ. LEE,
Secretary.

The following is the syllabus proposed by Dr. William H. Ford, President of the Board of Health of Philadelphia, of restrictive measures in the way of railroad inspection:

1. Inspection of passengers, cars, etc., by skilled officers for the purpose of detecting diseases. A sanitary officer to be placed on every immigrant train in order to have full knowledge and control. Stations should be erected at convenient places for side-tracking cars in which sickness occurs. The cars to be fumigated, disinfected and thoroughly purified in all particulars at such stations. Prompt notice sent to hospitals to transport sick. Water supply and vehicles changed and disinfected. Infected cars with patients detached and hauled to these stations. Places for disinfecting baggage, clothing, etc., of suspects.

HANDLING OF IMMIGRANT TRAINS.

2. Immigrant trains to be special trains and to be detained until satisfactory inspection has been made. Health authorities to be notified in advance of such coming trains. Certificates of the health of each immi-

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grant to accompany them on the trains, and to be certified to by the proper officer.

3. Circulars of instructions issued.

4. Immediate telegraphic notice to health officer when suspicious illness occurs on trains, and such cars side tracked at appointed stations until visited, inspected and disposed of by the sanitary officer.

5. Stations convenient for the railroads and health authorities to be selected near the terminals for the conduct of the inspection, disinfection, etc.

On the fourteenth day of September, immediately on his return from Harrisburg, the Secretary, in company with the committee of the National Conference of State Boards of Health on quarantine inspection, the mayor, the director of public safety, the Board of Health and the port physician of Philadelphia, made careful inspection of the plant at the Lazaretto, including the remodelled steamer "Georgeanna" designed for the detention and disinfection of suspects and baggage.

The committee referred to consisted of the secretaries of the State Boards of Health of Kentucky, Michigan and New Hampshire, and of the Provincial Board of Health of Ontario, Canada; one of the members being also the secretary of the American Public Health Association. They thus represented fairly the opinion of practical sanitarians over the whole continent and were unanimously in favor of a general system of railroad inspection at State borders.

It was a matter of congratulation to the Secretary and to the Philadelphia board that the commission was able to express itself in a very complimentary way as to the forwardness of the preparations made at this port for treating both immigrants and their effects.

Meantime the conditions became daily more alarming, so that it was deemed wise to call a meeting of the Committee on Sanitary Supervision of Travel and Traffic for Friday, the sixteenth, summoning the officers of the more important railroads to appear before the committee and state what steps were being taken in accordance with the instructions of the Board and the recommendations of the proclamation, and also to furnish the committee information as to appropriate sites, just within the State border for the establishment of camps of detention, should the necessity for them arise. This conference was attended by representatives of the three principal trunk lines operating in the State, by Dr. William H. Ford, President of the Philadelphia Board of Health, Dr. Henry Leffmann, chemist to the Board, Dr. William B. Atkinson, Medical Inspector of the Delaware district and Dr. Charles McIntire, Medical Inspector of the Lehigh district.

Much valuable information was furnished by the railroad officers who pledged their companies to the fullest co-operation with the Board in its proposed system of immigrant inspection on trains, suggesting, however, that the inspection should commence as far from the State

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line as possible in order to diminish interference with the movement of trains.

As there were members of the Board present sufficient to form a quorum, on the close of the conference, the Board organized and a meeting was held, at which it was deemed advisable to request a conference with leading citizens of Philadelphia at the mayor's office in order to take counsel as to the proper course to pursue in order to raise funds. This conference which took place Wednesday, September the twenty-first, was attended by the Citizens' Relief Committee of Philadelphia, the President of the Board of Health of Philadelphia, the port physician and members of our own Board, and was presided over by his honor the mayor. The measure of railroad inspection as a protection to the entire State was strongly urged by Dr. Shakespeare the port physician. It was the sense of this conference that the Chief Executive of the State was the only authority by whom money should be borrowed for State uses, should the necessity for obtaining it arise in the interval between sessions of the Legislature.

An interview with his Excellency the Governor was accordingly requested and took place the day following. The subject was discussed in all its aspects, and it was decided that the Secretary should keep the Governor informed of the situation, and of such unusual expenses as the same made necessary, which he on his part would hold himself in readiness to meet.

While indebtedness has been incurred, especially in its own medical inspectors, there has not yet been the absolute necessity for direct outlay such as would call for the proposed application. The efficient measures adopted by the Federal Government to check and indeed temporarily prohibit immigration have so diminished the present urgency of the situation, that it is now probable that no such call will need to be made before the session of the Legislature.

The idea of railroad inspection as one means of checking the advance of epidemics is no new one.

So clearly did the Board see its duty with regard to this question of thus limiting the progress of epidemic diseases, that at its very first meeting July 2, 1885, it adopted the following resolution, namely:

"*Resolved*, That the Secretary be instructed to communicate with the secretaries of the State Boards of Health of all contiguous states with reference to devising a plan of interstate supervision of travel and traffic in order to prevent the importation of infected goods or persons from one State into another."

Such conferences have been held from time to time, the last having taken place at Pittsburg on the eleventh day of the present month, as above stated, while each year the secretaries and delegates of all the State Boards of Health of this continent meet in general conference to discuss this and other questions of official administration. There is,

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therefore, a uniform plan of action adopted for the entire country which greatly facilitates the object in view, namely, the most complete limitation of epidemic disease with the least possible interference with travel and traffic. This plan contemplates the inspection of moving trains coming from infected places or suspected of transporting infected persons or goods, by competent physicians; the instant removal and isolation of any found to be affected with contagious disease, and the furnishing of such passengers as are considered to be free from the danger of carrying the infection with a certificate to that effect. The formal regulation authorizing the Secretary to instiute such inspections and isolate such passengers, on which the order of the Board to transportation companies was based, was adopted by the Board during the first six months of its existence. It will be found upon page 320 of the first annual report of the Board.

This system has received the endorsement of the most eminent practical sanitarians, and has been already in successful operation in several States of the Union. Its introduction will necessarily entail considerable expense. The inspectors must be intelligent, well educated physicians, of such age, standing, practical experience and knowledge of affairs as to command general respect. Their number must be sufficient to enable them to do their work thoroughly without serious interference with travel and traffic.

As a rule there are no considerable aggregations of population, and hence no boards of health, at points where railroads enter the State. It may, therefore, be necessary for the Board to establish camps of observation for suspects at several points near the State boundaries. As the people in the townships in which such camps would be located would be in no way responsible for their presence, and as they would be intended not for the protection of the people of these townships but of the entire State, simple justice would seem to indicate that the expense of maintaining the same should fall not upon the scanty populations of the townships but upon the entire state. However, that might be, the management of such camps should not be left to the people of the township, any more than that of a military camp should be in case of riot. Public safety demands that they should be under the direct supervision of this Board. Guards would be needed to enforce quarantine. It might be an open question whether they should be furnished by the sheriff of the county or the Adjutant General of the State. All experience shows that little dependence is to be placed upon the raw material of a posse. Should the necessity of such precautionary measures arise it is manifest that the Board would need a sum of ready money greatly in excess of its ordinary appropriation. It would be necessary to open a branch office with a staff of assistants solely for this work, in order that the routine work of the Board, which under the circumstances would materially be augmented, might go on interrupted. The protection of

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the streams of the Commonwealth from choleraic pollution might also require a considerable outlay.

The Board cannot too strongly urge upon the Legislature, therefore, the importance of making permanent provisions for future emergencies, by the establishment of an emergency Board, composed of the heads of certain of the departments, of which the Chief Executive of the State should be the chairman, and the appropriation of an adequate sum to be disbursed by said Board under proper restrictions and on the requisition of the proper authorities.

The only point at which such inspection was actually inaugurated by the Board, was Cumberland, Maryland, on the Baltimore and Ohio road, where Dr. J. S. Hackney, Medical Inspector of the Southern Tier district was stationed for a week, with the approval of the railroad company, and the consent of the Secretary of the State Board of Health of that State.

LEPROSY.

The leper who has been domiciled at the Delaware county pest-house at Lima for the past two years has recently made excursions into the neighborhood which have caused much anxiety to the inhabitants. It is a question whether this is a matter for interference on the part of the Board. of the local courts or of the sheriff of the county.

Two new cases of this disease have been discovered lurking in the city of Philadelphia. One of these had been for months acting as cook in a small hotel kept by Dr. Paine of bogus diploma notoriety, who was promptly fined by the City Board of Health for this criminal infraction of sanitary law. Both cases are now confined in the Municipal Hospital, on the grounds of which a separate building is being erected for the permanent reception of cases of this disease. Thus the prophecy on which your Secretary ventured a few years since, that unless stringent precautions were adopted, and a retreat for such unfortunates was provided by the national government, every city would need its leper house, is entering at this early date on its fulfillment.

INVESTIGATION WITH REGARD TO LEPROSY IN THE UNITED STATES.

Copies of the resolution adopted with regard to the spread of leprosy in the United States, and the necessity for national provision for the care of sufferers from that disease have been sent to the President of the United States and the Supervising Surgeon-General of the United States Marine Hospital Service.

The Secretary also visited Washington and conferred personally with the latter official on the subject, who will recommend it to the attention of Congress in his forthcoming report.

Circulars on this question have been sent to all State Boards of Health and to all prominent specialists in skin diseases, and numerous replies have been received showing that very general interest is being awakened in the matter.

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NOTIFICATION OF ARRIVAL OF INFECTED SHIPS AT THE PORTS OF NEW YORK AND PHILADELPHIA.

On the 16th of February the Secretary addressed a communication to the United States Commissioner of Immigration at the Port of New York, Hon. John B. Weber, requesting that immediate notification should be given this Board of the arrival of any vessel having infectious disease on board, on which were immigrants destined for points in this State.

On the 18th of February a courteous reply was received acceding to the request. The first list was received February 21st. Since then notifications have been received regularly. It will convey some idea of the immense tide of immigration which is pouring into this Commonwealth when it is stated that the steamer "Darmstadt," arriving March 24th, brought 400 immigrants for Pennsylvania alone. Information thus received is at once sent to the local authorities, who thoroughly appreciate the vigilance of the State Board in thus warning them of the possible approach of infection.

A similar arrangement was made somewhat later with the Hon. John J. S. Rogers, United States Commissioner of Immigration for the port of Philadelphia.

List of steamships arriving at the ports of Philadelphia and New York, either on which were cases of infectious disease or from ports infected with cholera, of which the State Board of Health was notified by the United States Commissioner of Immigration, and by Dr. John H. Rauch, surgeon in charge at the United States Quarantine Station at Camp Low.

From February 22nd, 1892, until June 28th, 1892, notifications were received in thirty-three instances, and were sent to towns and villages. Subsequent to that date, the notifications were as follows, and were sent to the authorities of towns to which the immigrants were destined, as indicated below:—

July 12th, smallpox on S. S. "Indiana," notifications sent 45.

July 12th, scarlatina on S. S. "Island," notifications sent 6.

July 16th, smallpox on S. S. "Werkendam," notifications sent 7.

July 25th, smallpox on S. S. "City of Chester," notifications sent 29.

July 26th, typhus fever on S. S. "Rugia," notifications sent 7.

July 30th, typhus fever on S. S. "Nevada," notifications sent 2.

August 1st, scarlet fever on S. S. "Cheriban," notifications sent 3.

August 31st, S. S. "Switzerland" from an infected port, notifications sent 29.

August 31st, cholera on S. S. "Sorrento," notifications sent 19.

September 2nd, scarlet fever on S. S. "Friesland," notifications sent 34.

September 24th, cholera on S. S. "Normannia," notifications sent 8.

September 25th, cholera on S. S. "Moravia," notifications sent 8.

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September 27th, cholera on S. S. "Rugia," notifications sent 2.
October 10th, cholera on S. S. "Bohemia," notifications sent 4.

THE PREVENTION OF BLINDNESS.

The Board will remember that its attention was once called by the Sydenham Medical Coterie of Philadelphia to the alarming increase of blindness and to the fact that much of it was preventable. A communication was presented early during the present year from a special committee of the Philadelphia County Medical Society, urging the same subject upon the consideration of the Board in the following terms:

Resolved, That the State Board of Health be requested to memorialize the Legislature of this State to pass a law, or to itself adopt a regulation, requiring that all cases of inflamed or reddened eyes of the new-born shall be reported to some health officer, or legally qualified practitioner of medicine within twelve hours of the time the disease is first noticed.

In response to this request, the following preamble and resolutions were adopted:

WHEREAS, It has been brought to the attention of this Board by two important medical societies of the city of Philadelphia, representing a large portion of the medical practitioners of that city, that from one-fourth and one-third of all cases of blindness are due to ophthalmia of the new-born, which is a preventable disease; therefore, be it

Resolved, That the following regulation be and is hereby adopted:

REGULATION IV.

Whenever in any city, borough, village or place in this State, having no health authority of its own, any nurse, mid-wife or other person, not a legally qualified practitioner of medicine, shall notice inflammation of the eyes or redness of the lids in a new-born child, under his or her care, it shall be the duty of such person to report the same to a legally qualified practitioner of medicine, within twelve hours of the time when the disease was first noticed.

Resolved, That this Board recommends the passage of a similar ordinance by the councils of all cities and boroughs, having health authorities of their own, or the adoption of a similar regulation by such health authorities.

A circular upon this subject giving the reasons for the adoption of the regulation and indicating the means to prevent blindness from the cause referred to has been issued by the Board and circulated among hospitals and training schools.

CONSUMPTION.

Acting under instructions from the Board, the Secretary has transmitted copies of the circular on consumption to the superintendents of all penal institutions throughout the State, with a letter calling their at-

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tention to the necessity for adopting certain precautions to prevent their institutions from becoming infected with the germs of this disease, and asking for statistics of the prevalence of this disease among the inmates.

Replies received up to the present time indicate that it is a rare thing for a case of consumption to be found in the smaller county jails. Returns have not yet been received from the State penitentiaries.

PENNSYLVANIA ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

As indicating the general diffusion among the people of a belief in the doctrine of the contagious and infectious character of consumption, it is interesting to note that a society has been formed in the city of Philadelphia, having for its object the prevention of the spread of this most prevalent and fatal of all diseases.

THE FLOODS AND FIRES OF JUNE 5, 1892.

Intelligence of the terrible destruction to life and property at Titusville and Oil City on the 5th of June, reached the Secretary at Detroit on June 6. He at once telegraphed to his Excellency the Governor inquiring whether the information in his possession led him to consider that the interference of the State Board of Health was necessary or desirable, and to the mayors of those cities inquiring whether tents were needed. A medical inspection of the regions affected was also ordered, and the Boards of Health were asked whether they needed assistance to meet the emergency. The replies of the Governor and the other officials indicated that the local Boards of Health and authorities were able to cope with the emergency. This was shortly afterwards confirmed by the report of Medical Inspector Woods.

On the 10th of June, the Secretary visited Oil City and conferred with the mayor and Board of Health. Accompanied by the President of the City Board of Health a careful inspection of the entire district was made, and every provision was found being made for the prevention of nuisances and care of the injured. A similar inspection of the Titusville region affected was also made a few hours afterwards in the company of the President of the Board of Health of that city. Much admirable work had also been done here by the local Board, but the immense area involved, and the low lying character of the district presented considerable difficulties in the way of abating the nuisances. About four hundred men were actively at work in the removal of débris, application of disinfectants, construction of drains and the opening of thoroughfares. The efficient manner in which these two Boards of Health had met such an overwhelming disaster afforded a convincing proof of the need of the compulsory establishment of Boards of Health throughout the entire State.

After carefully examining the causes of the disaster by fire in both of these instances, the Secretary was impressed with the fact that oil tanks or refineries should no longer be permitted in exposed positions on the

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banks of streams where they are liable to be undermined and swept away.

INSPECTION AT MEADVILLE.

While at Titusville the Secretary was requested by wire to visit and inspect Meadville, portions of which had also been flooded. The flood here had left much offensive débris, but the Board of Health had been taking admirable precautions to prevent any result prejudicial to the health of the city. The conditions at this city are somewhat peculiar as regards dangers from floods. Considerable engineering work and pecuniary outlay will be necessary and are essential to prevent constantly recurring catastrophies. The Secretary declined, however, to promise State aid in the matter. A difficulty having arisen in the city council with regard to the authority of the Board, the Secretary sustained them in all that they had done and advised them to continue in their important work regardless of opposition.

PROPOSED SEWERAGE OF DARBY CREEK VALLEY.

On the twenty-ninth day of June, the Board made an inspection of the neighborhood of the outfall of a proposed sewerage system, designed to carry the sewage of all the suburban towns and settlements on the line of the Pennsylvania railroad between Bryn Mawr and Berwin, with a possibility of also taking care of much of that which now flows into the Schuylkill. At the meeting in July the project received the approval of the Board, with the provisions that all solids be intercepted and cremated, or otherwise rendered innocious, that all other details of arrangement be such as to avoid the creation of nuisances prejudicial to the public health, and also that the sewer be so located that it can be readily extended to tide water if the protection of the public health demands it.

This constitutes the first effort in this State at combined action for drainage of a large rural area. It necessarily involves the question of the right of way already conferred on cities and boroughs for this purpose, and the Board, therefore, has thought good to suggest to the Legislature the enactment of a law conferring on sewerage companies the right of eminent domain for carrying sewers through private properties.

ENGINEER INSPECTORS.

The important step has been taken, during the year, of establishing the office of Engineer Inspector. Problems often confront the Board of an engineering rather than a medical character. The wisdom of the suggestion of the engineer member of the Board, Howard Murphy, Esq., C. E., that such questions should be referred to engineers rather than to physicians was apparent. The State was accordingly divided into two Engineer Inspection districts. Mr. William H. Boardman, C.

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E., was elected Engineer Inspector of the Eastern district, which, for the time being, comprises all that portion of the State lying east of the Allegheny ridge; and Col. Thomas P. Roberts, C. E., of Pittsburgh, Engineer Inspector of the Western district, comprising the counties west of the same line. Both of these officers have entered upon the discharge of their duties, and the character of their reports has justified the wisdom of their appointment.

CHANGES IN MEDICAL INSPECTORSHIP.

Dr. E. D. Payne, Medical Inspector of the Lycoming district, having been compelled to resign in consequence of ill health, the Board reluctantly accepted his resignation. His record has been that of an enthusiastic hygienist and faithful officer. His place has been filled by the appointment of Dr. S. M. Woodburn, also of Towanda.

Dr. Spencer M. Free, Medical Inspector of the Western Slope district, has also tendered his resignation in consequence of having moved outside of his district. The Board will lose in him an intelligent sanitarian and an energetic worker. This vacancy is yet to be filled.

SPECIAL INSPECTORS.

At the request of the Borough Council and Board of Health of Coatesville, the Secretary has given one of the inspectors of the City Board of Health of Philadelphia authority to make a house to house inspection of that borough.

At the request of the Philadelphia and Reading Railroad Company, Dr. Casper Morris, company surgeon, has been appointed Special Medical Inspector to the State Board of Health for the trains and property of the company, with authority to arrest and remove persons suffering from contagious diseases, and to destroy filthy clothing, baggage, bedding and other effects found upon the premises of the company.

LEGISLATION.

Among the duties assigned by law to the Board is that of suggesting "farther legislative action or precaution deemed proper for the better protection of life and health." This may be done in very few words.

The needs of the State continue as they have been ever since the establishment of the Board, and as the Board has pressed them upon the attention of each successive Legislature.

First. The sanitary organization of the State throughout the rural districts, so that every portion of the State may have some legally constituted local health authority.

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Secondly. The compulsory establishment of Boards of Health in all cities.

Thirdly. The authorization and establishment of Boards of Health in all incorporated boroughs.

Fourthly. Protection of the purity of water supplies.

Fifthly. The establishment of an emergency fund, with an appropriation adequate to meet ordinary emergencies; and

Sixthly. An increased appropriation for the ordinary work of the Board.

To this may be added the new suggestion made in a previous portion of this report, of an act to confer upon sewer companies the right of eminent domain through private properties.

CONFERENCES OF STATE AND MUNICIPAL BOARDS OF HEALTH.

In accordance with a resolution of the Board, the Secretary had invited and attended a conference of State and Municipal Boards of Health at Chicago with a view to formulating a definite plan for an exhibit of official sanitary work in the United States at the Columbian exposition, and submits the minutes thereof.

The Sixth State Sanitary Convention held at the city of Erie in the month of March was an occasion of much interest and profit. The annual address was delivered by Dr. Peter H. Bryce, of Toronto, Canada, secretary of the Provincial Board of Health of Ontario. The subject being the "Economic Value of Sanitation." It was illustrated with charts in such a way as to make its teachings readily comprehended by a popular audience.

The National Conference of State Boards of Health took place at Lansing, Michigan.

The Secretary, as instructed by the Board, presented the subject of the responsibility of National and State Governments in regard to the protection of the purity of water supplies. In consequence of the catastrophies at Titusville and Oil City he was obliged to leave before the full discussion of the subject took place.

As chairman of the section on State Medicine of the American Medical Association, the Secretary also presented the question of governmental prevention of pollution of streams before that body.

A conference has also taken place between the Secretary, the Chairman of the Committee on Water Supplies of this Board and the Committee on Water Supplies of the Philadelphia Board of Trade, with reference to the preservation of the purity of the Schuylkill river. It is proposed, in order to further this important object, to hold a conference at an early day at the city of Reading, to which all officials of cities and towns, and officers of water companies within the drainage area of that stream will be invited.

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Report of written communications received and sent; circulars distributed; circulars issued; circulars revised and additions to library during the year ending November 10, 1892:

Written communications received,	2,566
Written communications sent,	2,186

LIST OF CIRCULARS ISSUED.

No. 34. On Treatment of Apparently Drowned and Suffocated.
No. 35. On Prevention of Blindness.
No. 36. On Sanitary Protective Associations.

Special circular letter during the Asiatic Cholera Emergency, to Boards of Health and Health Authorities in Pennsylvania. Eight thousand of these circular letters were distributed.

LIST OF CIRCULARS REVISED.

No. 22. In German, on Precautions against Trichinosis.
No. 22. In English, Precautions against Trichinosis.

LIST OF CIRCULARS DISTRIBUTED.

Loose circulars distributed,	26,874
Circulars in boxes, each containing 18, 1,275 boxes,	22,950
Total,	49,824

ADDITIONS TO LIBRARY.

Total number of books received as exchanges,	88
Total number of books purchased,	11
Total number of pamphlets received as exchanges,	35

INTERSTATE NOTIFICATION OF COMMUNICABLE DISEASES.

Notifications Received.

Interstate notification of communicable diseases

During the year notifications of the existence of contagious or infectious diseases has been received from the secretaries of the boards of the following states and provinces:

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Small-pox.

Notifications received.

Province of Quebec, on eight occasions covering one outbreak.

Tennessee, on one occasion covering one outbreak.

New Jersey, on three occasions covering two outbreaks.

New York, on two occasions covering two outbreaks.

Ohio, on two occasions covering two outbreaks.

West Virginia, on one occasion covering one outbreak.

New Hampshire, on one occasion covering one outbreak.

Rhode Island, on two occasions covering one outbreak.

Iowa, on one occasion covering one outbreak.

Michigan, on one occasion covering one outbreak.

Illinois, on one occasion covering one outbreak.

California, on two occasions covering two outbreaks.

Province of Ontario, on one occasion covering one outbreak.

Wisconsin, on one occasion covering one outbreak.

Manitoba, on one occasion covering one outbreak.

Massachusetts, on one occasion covering one outbreak.

Typhus.

New York, on two occasions covering one outbreak.

Yellow Fever.

Mexico, on one occasion covering one outbreak.

Cholera.

New York, on one occasion covering one outbreak.

Notifications sent.

Similar notifications of the occurrence of communicable diseases in Pennsylvania have been sent to the secretaries of all the state and provincial boards of health as follows:

Small-pox.

On sixteen occasions covering ten outbreaks.

Leprosy.

On two occasions covering two outbreaks.

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Diphtheria.

On one occasion covering one outbreak.

Typhus.

On one occasion covering one outbreak.

Respectfully submitted.

BENJAMIN LEE,
Secretary.

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MINUTES OF THE BOARD.

Special Meeting, February 22, 1892.

Special meeting.

A special meeting of the Board was held at the Executive office, 1532 Pine street, Philadelphia, on February 22, 1892, at 2 p. m.

Present Dr. Pemberton Dudley, Dr. Geo. G. Groff, Mr. Howard Murphy, C. E., by proxy, Dr. J. F. Edwards and Dr. Benjamin Lee, secretary.

The Secretary stated that Mr. Howard Murphy, C. E., had been called to Shenandoah, Schuylkill county, at the request of the Shenandoah School Board to examine a school building rendered unsafe by undermining in a coal shaft.

In the absence of the President, Dr. Groff was called to the chair.

On motion, the reading of the minutes was dispensed with.

Report of Sanitary Convention Committee.

The Secretary presented the report of the Committee on Sanitary Convention. This report proposed a change in the date of the convention from the last week in February to the last week in March. It also contained a preliminary announcement of the convention for publication and distribution.

The report was accepted, and the proposals which it contained adopted.

Presentation of accounts.

Presentation of accounts being the next business in order, the Secretary presented vouchers Nos. 487 to 499 inclusive, covering the amount of nine hundred and ninety-nine dollars and sixty-three cents ($999.63). They were on motion approved.

Opening exercises laboratory of hygiene.

The Secretary then moved that when the Board adjourns it adjourns to attend the opening exercises of the Laboratory of Hygiene of the University of Pennsylvania.

It was carried.

On motion the Board then adjourned.

(Signed) BENJAMIN LEE,
Secretary.

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Minutes of a Special Meeting of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania.

Held on the Train between Williamsport and Erie, Monday, March 28, 1892.

Minutes of Special Meeting, March 28.

A special meeting of the Board was held on the train between Williamsport and Erie on Monday, March 28, 1892, at 10 a. m. Present Doctors Groff, Davis and Lee and Mr. Howard Murphy. In the absence of the president, Dr. McClelland, still in Europe, Mr. Howard Murphy was called to the chair. Dr. William B. Atkinson, Medical Inspector of the Delaware district was requested to act as assistant secretary. An order of business presented by the Secretary was adopted as the order of the day. The Secretary presented notes from Doctors Dudley and Edwards regretting their unavoidable absence. The Secretary presented the minutes of the Twentieth Regular Meeting, held at Harrisburg, November 12, 1891, and of a special meeting held at the Executive office, Philadelphia, February 22, 1892. On motion of Dr. Groff, the consideration of the minutes was postponed in order to allow the members to read them at their leisure.

Report of Secretary.

The Secretary then presented his report which included the following items.

Small pox at Point Pleasant.

1. Small pox having been reported at Point Pleasant, Bucks county, on the 15th of November, 1891, Medical Inspector Atkinson was at once dispatched to make an investigation. Under instructions from the Secretary, he placarded the house in which the disease existed, called a public meeting of the residents and with the assistance of Dr. A. M. Cooper, a resident physician, appointed sanitary, quarantine and finance committees. Day and night guards were established, and Dr. A. M. Cooper was commissioned by the Secretary, Deputy Medical Inspector of the Tinicum sub-district, including the townships of Tinicum, Bedminster, Plumstead, Buckingham and Soleberry, with full authority to inspect and enforce quarantine. Dr. Alexander, of the Lancaster county vaccine farm, was notified to send two hundred points of virus to Dr. Cooper and other physicians in the neighborhood.

The disease was confined to the first case, an Italian, who had come from Trenton, New Jersey, and an infant in the same house. The authorities of Doylestown were

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communicated with and recommended to urge the citizens to have vaccination performed.

The chairman of the directors of the poor of the county was notified that it was their duty to provide for the necessary expenses of nursing and quarantine, and should new cases occur to have them quarantined in the county pest house.

The action of the Secretary in the appointment of a Deputy Inspector was approved, and on motion of Dr. Groff, the letter of instruction was ordered to be spread upon the minutes, as follows:

Dr. WILLIAM B. ATKINSON, *Medical Inspector, Delaware District:*

SIR: In making your inspection at Point Pleasant, your first step will be to see Dr. Cooper, if possible, then to visit the house and placard it, after verifying the diagnosis. The more influential citizens should then be assembled, and sanitary, finance and quarantine committees appointed. The Sanitary Committee will have charge of cleaning up and disinfecting throughout the town, and of vaccination. The State Board of Health will furnish virus but can assume no other expenses. The Quarantine Committee will appoint day and night guards, and allow no one to go in or out of the infected house except the physician. They will provide food and medicine at the expense of the village, if the family of the patient or patients cannot afford it, for all quarantined persons, who will make known their needs through a selected spokesman by word of mouth, no letter or other piece of paper being allowed to pass outside the lines. A vacant house should be selected to which those exposed in the infected house, but not sick, can be removed for observation, only those necessary for the care of the patient remaining. Persons thus under observation should be detained eighteen (18) days. In case of one of them being taken sick with this disease, or any other person in the village being so taken sick, such person must be removed to the house in which the present case now is, which will be the quarantine hospital. If, however, there is a small pox hospital connected with the county almshouse, it is the duty of the directors of the poor to have all new cases removed to that building and properly cared for at the expense of the county. All persons known to have been exposed to the contagion must be vaccinated first, and later the entire population.

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The Finance Committee will proceed at once to raise funds to meet the necessary expenses. If an additional case occurs it will be necessary to procure a nurse. The physician will make no unnecessary visit within the lines, but will keep himself constantly informed by verbal communication with the nurse of the condition of the patient. After leaving the house he will make a complete change in his clothing and take a disinfectant bath, before visiting any other patient.

The circular of the Board on Precautions against small pox should be placed in every family by the Sanitary Committee. Until the Quarantine Committee have selected the guards, you are authorized to assign the duty of watching the house to the town constable. The guards will wear the badge of the State Board of Health, and are authorized to arrest and return to the house any person or persons endeavoring to escape therefrom, and to use such force as may be necessary to accomplish this object. You will inform yourself of the distance of all neighboring towns and villages, and of the frequency of communication between them and Point Pleasant. You will immediately report to this office upon your return, the number of persons sick, the probable number exposed, the number of inmates of the infected house, the population of the village, the names of railroads passing through or near it, and the number of persons vaccinated up to the present time.

Yours very truly,

(Signed) BENJAMIN LEE,

Secretary."

Small pox at Morrisville.

2. Request was received from the burgess of Morrisville, Bucks county, for the assistance of the Board in dealing with a case of small-pox in that borough, November 25, 1891. The inspection was at once made by Medical Inspector Atkinson. He found the house already placarded by order of the burgess, a professional nurse engaged, a guard posted and vaccination being thoroughly performed. Instructions were sent to the burgess as to the enforcement of precautions in detail, and also with regard to the steps to be taken should other cases occur. Fortunately this was not the case, as there was no further development of the disease. It may be stated that the individual who was the cause of so much annoyance and expense, although doing business in Trenton and aware of the pre-

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valence of small pox, had stubbornly refused to be vaccinated. It was a pleasure to the Secretary to find a burgess so thoroughly alive to the responsibility resting upon him and so intelligent in its discharge.

Piggery nuisance at West Laurel Hill.

3. Complaint having been received of the existence of a nuisance in the shape of a piggery near West Laurel Hill station, just outside the limits of Philadelphia, maintained by a garbage collector of the adjoining district in Philadelphia, communications were addressed to the Board of Health of that city and to the Street Commissioner as well as to the collector himself, with the result of the prompt abatement of the nuisance.

Sewerage and drainage of Pottstown.

4. At the request of prominent citizens of Pottstown, Montgomery county, Medical Inspector Atkinson was instructed to visit that town, and investigate the condition of its sewage and drainage.

His report showed a lamentable and disgraceful absence of all proper arrangements for sewerage, dependent in part, as claimed by the borough authorities, on the fact that the borough had already reached its limit of bonded debt.

The report after being submitted to Mr. Howard Murphy, Chairman of the Committee on water supply, sewage, etc., was placed in the hands of the complainants for their information.

Instructions to citizens of Greencastle.

5. Medical Inspector R. L. Sibbet in concluding his inspection at Greencastle, Franklin county, had issued a series of recommendations to the borough authorities and citizens, which were printed at the expense of the borough, and are herewith submitted.

Nuisance from apple pomace at Chambersburg.

6. A somewhat unusual complaint was that received from Chambersburg, Franklin county, of a nuisance in the shape of the refuse from a large cider mill constituting what is known as apple pomace.

The Secretary considering that Prof. Groff was probably better acquainted with the manufacture of cider and its resultants than himself, submitted the question to him as to the probability of disease resulting from this source. His reply sustained the position taken by the owner of the mill, himself a chemist and physician, who claimed that the acids developed by the process of fermentation would be destructive of disease germs rather than productive of them. The proprietor maintained that the attempt to remove this fermenting mass during hot weather would create a greater nuisance than its treatment with

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quicklime which he was pursuing, and promised to remove it as soon as the weather would permit.

7. Medical Inspector Atkinson reports an inspection of a house in which scarlet fever occurred at Ardmore. The house was placarded, circulars were left, and, inasmuch as a public funeral had recently been held of a child dead of that disease, circulars on the danger of public funerals in such cases were also sent to the clergy of St. Denis, by whom the funeral was conducted, and to all the clergy of that neighborhood; also to the resident physicians. The complaint was received in this instance from Dr. Edwin C. Town, Special Inspector of the State Board of Health for the Pennsylvania Railroad Company.

Scarlet fever at Ardmore.

8. The long continued and fatal prevalence of diphtheria at Locust Gap, Northumberland county, led the Secretary to appoint Dr. B. F. Bartho, of Mt. Carmel, Deputy Medical Inspector of that township. The Secretary is glad to be able to report that Dr. Bartho has justified the appointment by organizing a local board of health, which has gone to work with great vigor, cleaning up the place, improving drainage, abolishing public funerals, quarantining and disinfecting with the result of at once materially diminishing the number of cases.

Diphtheria at Locust Gap.

The Secretary requested the confirmation of Dr. Bartho as Deputy Medical Inspector. On motion of Mr. Howard Murphy the action of the Secretary was approved and the appointment confirmed.

9. The Secretary had granted permits for the disinterment and removal of the remains of the following persons dead of small-pox under the following precautions, namely: When within six inches of the coffin the ground to be saturated with a strong solution of quick lime, the coffin to be at once placed in a hermetically sealed casket or box with metallic lining, no person to be present except those actually concerned in the work of disinterment. Mrs. James Halligan, from Clarion Junction to Sartwell, McKean county; transportation to take place in an undertaker's wagon and to avoid all towns. Susanna Penrod, from Westmont, a quarter of a mile from Johnstown, a private burial ground, to the Grand View Cemetery of Johnstown.

Disinterment of bodies dead of small-pox.

William McFall, from one grave in the cemetery of Tarentum to another grave in the same cemetery.

The action of the Secretary was approved.

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10. On the 6th of January the Secretary received the following telegram from Dr. A. A. Woods, Health Officer of Erie, Medical Inspector of the Lake District:

Diphtheria at Erie.

"Telegraph power to close schools here; diphtheria epidemic; come if I telegraph to-morrow; explanation in post." To this the Secretary replied:

"Close such schools as you consider necessary to check epidemic of diphtheria." At the same time the Secretary wrote Dr. Woods advising a conference between himself and the school directors, and the endeavor to persuade them, in view of the facts which he could lay before them, to themselves take this step. A letter was received from Dr. Woods January 11th just as the Secretary was leaving to attend a conference of State and Municipal Boards of Health at Chicago, with reference to a sanitary exhibit at the World's Columbian Exposition, inquiring as to the powers of the Secretary during the interval of a meeting of the Board, to which the Secretary replied by wire from Altoona:

"Letter received; full powers delegated to me by express regulation." On the 13th of January the following telegram was received from Dr. Woods, addressed to Chicago:

"Total cases reported since September, 195; deaths—October, 10; November, 11; December, 25; January, 15; week ending December 19, 7; week ending December 26, 9; weeks ending January 2 and 12, 8 each. Eleven new cases reported January 10, 11 and 12, all in new houses. Have 18 houses placarded containing 44 cases. I proposed to committee to close buildings having pupils sick; they refused. Papers condemn the school board; majority of papers support me; lawyer advises peremptory mandamus; court will grant."

As a result of Dr. Woods' wise and energetic action and untiring devotion, the epidemic began to decline rapidly, and public opinion was so thoroughly aroused that the attendance on schools from which cases appeared to originate almost entirely ceased. They were thus practically closed and the mandamus was not called for.

Dr. Woods' management of this serious epidemic cannot be too highly commended. The department of public education being a distinct branch of the State Government, having plenary powers of its own, it will readily be seen that the State Board of Health should endeavor, wherever it is possible, to exert its influence

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for the control of epidemics, rather by acting as an advisory body to that department, than by asserting its own authority which it undoubtedly possesses. The action of the Secretary was approved.

Cerebrospinal meningitis at Phillipsburg.

11. On information that six deaths had taken place from cerebro spinal meningitis in the town of Phillipsburg, Centre county, Medical Inspector Dudley was instructed to investigate. He was unable to discover any cause for the existence of this disease beyond deficient ventilation. The Secretary addressed a note of inquiry to Prof. Lewis A. Sayre, resident physician of the city of New York some thirty years since, who he remembered had written an interesting report on an investigation into an epidemic of this disease among the fishermen at Long Branch. Dr. Sayre's reply showed that the conditions which he found to exist were, almost entire absence of ventilation, the fishermen caulking their windows and every crack through which air could enter, the use of kerosene lamps, which were invariably allowed to burn turned low, and therefore with imperfect combustion, the entire night; and finally low and innutritious diet.

The Secretary considered that this suggestion of Dr. Sayre of the noxious effects of the imperfect combustion of coal oil was one of considerable importance. On motion of Dr. Davis he was instructed to formulate a circular on the subject of the deleterious effects of burning illuminating oils in bed rooms during the night, and its possible connection with cerebro spinal meningitis.

Pollution of wate supply of Harr burg.

12. The attention of the Secretary was called to a discoloration of the water supplied to the citizens of Harrisburg, in a communication from the mayor of that city, Hon. John A. Fritchey. The subject was referred to Mr. Howard Murphy, C. E., chairman of the committee on Water Supply, Drainage and Topography. He visited Harrisburg, conferred with the authorities of the city and of the water department, and made certain suggestions to them with regard to obtaining their water from a point farther from the shore of the river than the position of the present intake.

In a letter addressed to Mayor Fritchey, Mr. Murphy gave careful instructions as to the importance of extreme care to prevent any impurity from entering the bottles into which water was to be introduced for examination.

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On motion of the Secretary, Mr. Howard Murphy was requested to confer with Dr. Henry Leffmann on the subject of the necessary precautions to be adopted in collecting samples of water for analysis, and after such conference to prepare a set of instructions for this purpose, to be printed and affixed to each demijohn sent out by the Board for the collection of samples.

Typhoid fever from milk supply at Nanticoke.

13. An epidemic of typhoid fever in Nanticoke, Luzerne county, beginning in the month of October last, was carefully investigated by Medical Inspector Taylor, who arrived at the conclusion that it was caused by polluted milk. The reports from Dr. Taylor, and analysis of well water from a well on the dairymen's property were submitted.

Transportation of bodies dead of diphtheria.

14. In accordance with the instructions of the Board, the resolution announcing the modification of the regulation regarding the transportation of dead bodies, so as to forbid the transportation of bodies dead of diphtheria had been sent to all local boards in Pennsylvania, to all railroad companies in Pennsvlvania, and to all State Boards of Health. The leading railroad companies had issued circulars to their agents embodying the new regulation. copies of which were presented.

In the absence of health authorities in nearly all small towns, the Secretary had found it necessary to authorize burgesses and justices of the peace to issue transportation permits. On motion the action of the Secretary was approved.

Abstracts of reports of local boards.

15. Abstracts of annual reports of the following cities and boroughs were presented: Carbondale, Chester, Johnstown, Lancaster, Phœnixville, Scranton and Titusville. They were ordered to be printed in the annual report.

Conference of State and municipal Boards of Health.

16. In accordance with a resolution adopted at the last meeting, the Secretary had invited and attended a conference of state and municipal boards of health at Chicago with a view to formulating a definite plan for an exhibit of official sanitary work in the United States, and submitted the minutes thereof.

Analysis of lard compound.

17. A specimen of "lard-compound" had been submitted to the Board for analysis by the Scranton Board of Health. Dr. Leffman made the analysis and found nothing deleterious in the article. It contained a considerable proportion of cotton-seed oil.

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18. A copy of the bill now before Congress to prevent the adulteration of food and drugs was presented, and the Secretary was requested to address a note to Senator Paddock, who introduced the bill, endorsing his effort.

Act of Congress to prevent food and drug adulteration.

The Board at this point in the report, on motion, took a recess for dinner.

The Board re-assembled at 2 p. m. and the Secretary proceeded with the presentation of his report.

19. The opening of the Laboratory and Institute of Hygiene of the University of Pennsylvania had been attended by the Board, which was represented on the program in the person of its secretary. The occasion was one of great interest and was attended by large numbers of influential citizens.

Opening of the Laboratory of Hygiene of the University of Pennsylvania.

20. Immediately upon the discovery of typhus fever in the city of New York, due to the arrival of Russian immigrants on the steamer "Masillia," through the courtesy of the Secretary of the New York State Board of Health, the names and special destinations of each individual ticketed to Pennsylvania were furnished to the Secretary. Fifty-two names were sent destined for eleven places. These were forwarded at once to the authorities of each place, with the necessary instructions, and within a week information had been received that every one had been located and was under observation. One case of typhus only had developed outside of Philadelphia and that was at Pittsburg. A suspected case at Bristol was investigated by Medical Inspector Atkinson, who pronounced it one of indigestion.

Measures taken to prevent the spread of typhus fever in the State.

21. Copies of the resolutions adopted at the last meeting with regard to the spread of leprosy in the United States, and the necessity for national provision for the care of sufferers from that disease had been sent to the President of the United States and the Supervising Surgeon General of the United States Marine Hospital Service.

Investigation with regard to leprosy in the United States.

The Secretary had also visited Washington and conferred personally with the latter official on the subject, who would recommend it to the attention of Congress in his forthcoming report.

Circulars on this question had been sent to all State Boards of Health and to all prominent specialists in skin diseases, and numerous replies had been received, showing that very general interest was being awakened in the matter.

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Dedication of the Conemaugh Valley Hospital.

22. An invitation having been received for the members of the Board to attend the dedication of the Conemaugh Valley Memorial Hospital at Johnstown, the Secretary had replied and submitted his letter.

Extension of Interstate notification to Mexico.

23. A communication was read from Dr. Irving A. Watson, secretary of the American Public Health Association, suggesting the extension of the system of interstate notification of infectious diseases to the Republic of Mexico. On the suggestion of Mr. Howard Murphy, the Secretary was, on motion, instructed to address a communication to the Superior Board of Health of Mexico, notifying it of the willingness of this Board to enter upon such an arrangement.

Notification of arrival of infected ships at the port of New York.

24. On the 16th of February, the Secretary addressed a communication to the United States Commissioner of Immigration at the port of New York, Hon. John B. Weber, requesting that immediate notification should be given this Board of the arrival of any vessel having infectious disease on board, on which were immigrants destined for points in this State. On the 18th of February a courteous reply was received acceding to the request. The first list was received February 21. Since then notifications have been received as follows: February 26th, March 1st, 2d, 5th, 6th, 15th, 16th, 18th, 23d and 25th. It will convey some idea of the immense tide of immigration which is pouring into this Commonwealth when it is stated that the Steamer "Darmstadt," arriving March 24th, brought four hundred immigrants for Pennsylvania alone. The Secretary has notified the commissioner that in future it will not be necessary to report measles. Information thus received is at once sent to the local authorities who thoroughly appreciate the vigilance of the State Board in thus warning them of the possible approach of infection.

Communication from the Board of Health of Baltimore with regard to membranous croup.

25. Information had been received from the Board of Health of Baltimore, that the body of a child had been brought to that city, having a permit from the Board of Health of Lancaster, Pennsylvania, stating that it had died of "membranous croup, which was a non-contagious disease." The Baltimore Board of Health desired to know if this was the rule of our Board. The Secretary replied that our Board had two years ago classed membranous croup with diphtheria, as a contagious disease and notified all local boards of this action. It was possible that the Lancaster Board was not in active existence at

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that time. He therefore moved that Dr. Davis be a committee to confer with the Lancaster Board urging upon it the importance of subjecting membranous croup to the same restrictions in every particular to which diphtheria was subjected. It was carried.

Diphtheria at Springfield.

26. The two justices of the peace of Springfield, Delaware county, had waited upon the Secretary to notify him of the existence of diphtheria in that township, and of the reprehensible carelessness of the undertaker of that place in regard to the disposal of infected articles. In order to insure the enforcement of proper precautions, the Secretary had commissioned the justices, namely Richard Young and William H. Newlin, as Deputy Inspectors of the Board for the Springfield District for the space of two months, beginning December 1, 1891, with authority to enforce section 18, sections 34 to 38, and sections 46 to 48 of the model ordinance. The action of the Secretary in the appointment of the above named Deputy Inspectors was approved.

Appointment of Inspectors.

Legal opinion on interference of public and private nuisances.

27. A decision having been submitted to the Board to the effect that participation in a public complaint of a nuisance debarred an individual from bringing a private suit for damages, it was referred to Alfred Lee, Esq., Atty., for an opinion. The opinion sustained the decision of the judge.

Decision of the Supreme Court in regard to pollution of wells from gas works.

28. In the case of Collins *vs.* the Chartiers Valley Gas Company, Justice Williams affirmed the judgment of the lower court, to the effect that the company was liable for damages for the pollution of wells by salt water, because it had been shown that no proper precautions had been taken to prevent such pollution by its operations, although it was well known that such pollution was likely to occur.

Legal opinion in regard to the right of the Board to purchase or condemn a dam.

29. In the case of a dam which had been pronounced by Medical Inspector Free to be a cause of malarial disease at Punxsutawney, the Medical Inspector had suggested that the Board should condemn the dam and then purchase it and destroy. The Secretary had referred the question to Alfred Lee, Esq., Atty., whose opinion was that the Board had no authority to purchase and hold real estate, although there was no doubt of its right to condemn the dam. The authorities of the town were the proper persons to make the purchase.

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Diphtheria at Horton City.

30. Information having been received of the existence of diphtheria at Horton City, Indiana county, Medical Inspector Free investigated the matter on the order of the Secretary and found it unnecessary for the Board to interfere.

Complaint of a cesspool nuisance at Ardmore.

31. A complaint of a nuisance from a double cesspool in the neighborhood of Ardmore, owing to the fact that one of the parties refused to pay his share towards having it cleaned, had lapsed for the want of the proper number of signatures

Scarlet fever in a public school at Eldred.

32. The president of the Board of School Controllers of Eldred, McKean county, had written stating that there was an epidemic of scarlet fever in the village, and that medical opinion was divided as to the period during which a case was infective. The Secretary had replied that it was dangerous from the first moment, but that the infection was most virulent during the period of desquamation or peeling. Hence the necessity for at least six weeks detention from school.

Small-pox in Philadelphia.

33. Two cases of small-pox had occurred in Philadelphia in January. They had been properly guarded by the city board and the infection stamped out. The Secretary had notified all other boards in Pennsylvania, and the other state boards of its existence.

National Conference of State Boards of Health at Lansing, Michigan, June 6, 1892.

34. A communication was presented from Dr. C. O. Probst, Secretary of the National Conference of State Boards of Health, informing the Board that the conference would be held at Lansing, Michigan, June 6 and 7, and requesting the presence of the Board or a delegate at the meeting; also requesting the Board to formulate one or more questions or propositions for discussion, and to name persons to participate in the same. In reference to the latter request the Secretary had suggested the subject of action by the National Government for protecting the purity of streams.

On motion of Dr. Davis, the Secretary was appointed a delegate with expenses paid as usual, and it was ordered that credentials be supplied to any other member of the Board desiring to attend.

Meeting of the American Public Health Association, at Mexico.

35. In regard to the meeting of the American Public Health Association to be held in the city of Mexico, November 30, 1892, it was decided that any member desiring to attend, should be furnished with credentials, but that the meeting being in a foreign country, the Board could not be responsible for the expenses of such attendance.

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36. At the last meeting of the Board, the question had been raised whether the place of burial of the small-pox victims at Clarion Junction, Elk county, was so situated as to endanger the purity of the water supply. The Secretary had found upon careful inquiry that all the houses had water piped to them in an iron pipe from a spring high up on the mountain, so that pollution was impossible.

Interment of small-pox cases, and water supply of Clarion Junction.

37. The excellent forms of the Easton School Board for reporting infectious diseases, and excluding the latter from schools, were submitted.

Forms of Easton School Board for contagious diseases.

On motion of Dr. Groff, it was ordered that these forms be added to circular on school hygiene, No. 2, in the next issue.

38. A female teacher of a public school at Stewartstown had complained that the father of one of the pupils, who had recently had scarlet fever, had insisted on his attendance and inquired what the law was on the subject. The Secretary had replied that the entire authority was in the hands of the school board, and sent copies of the school hygiene circulars and of the model ordinance.

Scarlet fever in public school at Stewartstown.

39. The Secretary of the Board of Health of Lancaster had called the attention of this Board to the fact that two children had recently died of diphtheria in the county of Lancaster, without medical attendance, their parents being believers in the "faith cure," and that in both instances public funerals had been held. The Secretary had replied that the Legislature had failed to respond to the urgent request of the Board to forbid public funerals in contagious diseases. The Board had, therefore, issued a regulation itself forbidding them, but could not attempt to enforce it until it had been published in a newspaper in every county-town in the State. This would necessitate an expense which the limited appropriation of the Board did not at present warrant.

Diphtheria and "Faith Cure."

40. Three fatal cases of diphtheria having occurred in a house at Ogontz, Montgomery county, and other children in the same family being exposed, the Secretary ordered the house to be vacated and disinfected and the family removed to another dwelling provided for the purpose by charitably disposed neighbors. In order to ensure the execution of these orders, Mr. Robert Shoemaker, of Ogontz, was commissioned as Deputy Inspector for a period of six months. The Secretary requested

Diphtheria at Ogontz; appointment of Deputy Inspector.

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that this appointment be confirmed, which, on motion, was done.

Complaint of filthy tenement at Ogontz.

41. The building next adjoining that in which these deaths took place was the toll-house of the Cheltenham and Willow Grove Turnpike Company. This building was declared by Dr. Ralph Lee Cooper, of Ogontz, to be in a very filthy condition, and decayed from age. Its occupant had a large family of children, who were not properly cared for, and the whole condition of the place was, under the circumstances, a menace to the neighborhood. Residents of Ogontz to the number of ten united with Dr. Cooper in this complaint. Dr. Cooper was commissioned as Deputy Medical Inspector for the Cheltenham district without limit of time. The Secretary asked for a confirmation of the appointment, which, on motion, was granted. An order was served on the turnpike company by Deputy Inspector Cooper, for the vacation and demolition of the toll house and thorough disinfection and cleaning of the lot on which the house stood.

Appointment of Deputy Inspector.

Malignant diphtheria from an untrapped sewer at Latrobe.

42. Fatal cases of diphtheria had occurred at Latrobe, Westmoreland county, following promptly upon the connection of a dwelling house with a new sewer, without the intervention of a trap. The Secretary had advised the head of the family to prosecute all concerned in the outrage.

Inspection of school at Shenandoah.

43. The superintendent of schools at Shenandoah had requested that an engineer be sent up to inspect an unsafe school building, and Mr. Howard Murphy had at once gone to investigate the matter.

Pollution of water supply of Scranton.

44. Information had been received from the Health Officer of Scranton, Lackawanna county, of the pollution of the water supply of that city by a slaughter house outside the city's jurisdiction. The Secretary replied that if a formal complaint were made an inspector would be sent to investigate and report. A blank was enclosed for the purpose but had not yet been returned.

Disposal of the sewage of Reading

45. An inquiry had been made by an engineer who had been consulted with regard to the sewerage of Reading, Bucks county, as to what limit of pollution the Board would assign to the effluent which might be permitted to flow into the Schuylkill river. The Secretary had referred the communication to the committee on water supply, drainage, sewerage, etc., but had also written to the inquirer that any system adopted should include a subsidence catch basin, which should strain out all solids,

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and a filter bed of sufficient extent and efficiency to notably diminish the number of bacteria.

Defective drainage at Lansdowne.

46. Ten citizens of Lansdowne, Delaware county, having united in a complaint of improper disposal of the contents of a cesspool, Medical Inspector Atkinson was ordered to investigate and sustained the charge, but also reported that the entire settlement was greatly in need of proper drainage facilities. An order forbidding the repetition of the nuisance was sent.

Small-pox at Titusville.

47. A case of small-pox had occurred in Titusville traceable to infected baggage from the S. S. "Diana," which arrived at New York March 5, with small-pox on board. The length of time which had elapsed since the direct exposure of the patient on the ship pointed to that conclusion. The local board had treated the case energetically and prevented the spread of the disease. This occurrence suggested the importance of proper disinfection of baggage at quarantine stations.

Necessity for disinfection of baggage of immigrants.

On motion of Dr. Davis the Secretary was instructed to address a communication to the Health Officer of New York, insisting on the importance of the disinfection of all baggage in steamers on which cases of small-pox, typhus fever, scarlet fever and diphtheria had prevailed; and also that of patients which had been in hospital with contagious diseases. On motion of Dr. Groff the Secretary was farther instructed to introduce this subject at the National Conference of State Boards of Health.

Private inspection of dairy cows in the interest of public health.

48. Tuberculosis having been comparatively recently discovered to prevail in dairy herds, Mr. George Abbott, an extensive milk dealer of Philadelphia, had made an arrangement for the systematic inspection of his forty-four herds of milch cows by competent veterinarians at stated intervals. This showed how strongly the question of the conveyance of tuberculosis by milk had taken hold of the public mind. The Secretary had replied to Mr. Abbott's communication on the subject, highly commending the step, and urging also systematic inspection of the stables and yards.

Private inspection and slaughter of dairy cows.

49. Another incident of great interest in this connection was the sacrifice by Mr. J. E. Gillingham, of Villa Nova, of his entire herd of fine Jersey cows, which had been tested by innoculation with Koch's tuberculin, and found to be universally infected. The Secretary had been prevented from attending the autopsies but had delegated Medical Inspector Atkinson to do so and re-

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port. Such a sacrifice in the interest of the public health is as commendable as it is rare. The tuberculin test seems to be thoroughly established by the results of these experiments. The Secretary was, on motion of Dr. Groff, instructed to express to Mr. Gillingham the appreciation of his public spirited conduct by the Board.

Circular on dairy hygiene.

50. The circular on Dairy Hygiene authorized at the last meeting is nearly completed. Dr. Groff has been actively aiding the Secretary in its preparation by correspondence with prominent dairymen.

Dissolution of the Board of Health of Lock Haven.

51. The late Secretary of the Board of Health of Lock Haven, Clinton county, had announced the dissolution of the board by action of the councils. The Secretary was instructed to address a communication to the councils urging them to reconsider their ill-advised action.

On motion a recess was now taken until 8 p. m.

At 8 p. m. the Board reconvened at the Reed House, Erie, Mr. Howard Murphy in the chair.

On motion of Dr. Davis, Dr. A. A. Woods, Medical Inspector of the Lake District and Health Officer of Erie, was invited to be present as a guest of the Board. The Secretary continued his report, as follows:

Diphtheria at Greensburg.

52. An epidemic of diphtheria had been reported in Greensburg, but investigation had failed to sustain the report.

Leprosy in Philadelphia.

53. A case of leprosy had recently been discovered in Philadelphia in the person of a Japanese, living as cook in the hotel kept by the notorious Dr. Paine, of bogus diploma fame. It had been promptly isolated at the Municipal Hospital, and Dr. Paine had been fined for concealing the case.

Typhus fever in Philadelphia.

54. A case of typhus fever had also occurred in Philadelphia which was likewise promptly isolated. The infection was brought from Worcester, Massachusetts, where the patient had been nursing six typhus cases resulting from the "Massilia" outbreak. The chairman called attention to the fact of the constant presence of typhus in the Republic of Mexico, and suggested that the Secretary should call the attention of the National Conference of State Boards of Health to the same. On motion of the Secretary such reference was made.

Drainage of Devon Inn.

55. The time for the completion of the improvements proposed in the drainage purification system of the Devon Inn having nearly expired, the Secretary had written to Messrs. Coffin and Altemus, who had assured

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him that everything had been arranged to the satisfaction of Mr. English, the complainant. The Secretary proposed, however, to have another inspection made at an early date.

Improvement in disposal of drainage of State Normal School at Millersville.

56. The Secretary called upon Dr. Davis to report as to the present condition of the drainage system of the State Normal School at Millersburg, Lancaster county. Dr. Davis reported that the suggestions made by the Board after its visit of inspection had been fully carried out, to the satisfaction of the neighbors, of the school authorities themselves, and of all concerned.

Reported small-pox at Clarke's Valley.

57. Small-pox had just appeared at Clarke's Valley, Schuylkill county. Medical Inspector Weidman had been ordered to investigate, and his report would probably arrive during the meeting.

Emergency Hospitals.

58. Dr. G. Groff submitted a draft of a circular on Emergency Hospitals. On motion of Dr. Davis the Secretary was instructed to confer with the Adjutant General of the State with reference to furnishing the Board hospital tents for use in sudden emergencies.

Sixth State Sanitary Convention at Erie.

59. On behalf of the committee on the Sixth State Sanitary Convention, the Secretary announced that the arrangements were completed. Dr. A. A. Woods on behalf of the local committee submitted the preliminary announcement and the program. The latter in an amended form was now ready for distribution. The Secretary moved that when the Board adjourns, it adjourn to take part in the Sixth Sanitary Convention, and to meet at the call of Chair or Secretary. It was carried.

Circular on the prevention of blindness.

60. The Board would remember that its attention had been called by the Sydenham Medical Coterie of Philadelphia to the alarming increase of blindness, and to the fact that much of it was preventable.

A communication was now presented from a special committee, of which the Secretary was a member, of the Philadelphia County Medical Society, urging the same subject upon the consideration of the Board, in the following terms:

Resolved, That the State Board of Health be requested to memoralize the Legislature of this State to pass a law, or to itself adopt a regulation requiring that all cases of inflamed or reddened eyes of the new born shall

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be reported to some health officer or legally qualified practioner of medicine within twelve hours of the time the disease is first noticed.

T. B. SCHNEIDEMAN,
Secretary.

On motion of Dr. Davis, seconded by Dr. Groff, the following preamble and resolutions were adopted:

WHEREAS, It has been brought to the attention of this Board by two important medical societies of the city of Philadelphia, representing a large portion of the medical practioners of that city, that from one-fourth to one-third of all cases of blindness are due to ophthalmia of the new born, which is a preventable disease; therefore, be it

Resolved, That the following regulation be and is hereby adopted:

REGULATION VI.

Whenever in any city, borough, village or place in this State having no health authority of its own, any nurse, midwife or other person, not a legally qualified practitioner of medicine, shall notice inflammation of the eyes or redness of the lids in a new born child under his or her care, it shall be the duty of such person to report the same to a legally qualified practitioner of medicine within twelve hours of the time when the disease was first noticed.

Resolved, That this Board recommends the passage of a similar ordinance by the councils of all cities and boroughs having health authorities of their own, or the adoption of a similar regulation by such health authorities.

This concluded the reading of the report of the Secretary, which was, on motion, adopted, and the action of the Secretary as detailed therein approved.

Presentation of accounts.

The next business in order was the presentation of accounts. The Secretary stated that a quorum of the Executive Committee not being present, the accounts had not yet been audited. He therefore moved that the Chair appoint a member to fill the place of Dr. Dudley on that committee, *pro tempore*, and that a recess be taken to enable the committee to sit. It was so ordered and a recess of fifteen minutes was taken.

On reconvening the Secretary presented accounts, vouchers No. 500 to No. 522, inclusive, amounting to

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$916.53, which had been audited and found correct by the Executive Committee. They were on motion approved. The Board then adjourned to meet at the call of the Chair.

(Signed) BENJAMIN LEE,
Secretary.

The Board met at the call of the Chair, pursuant to adjournment at the Reed House. An informal discussion of the diphtheria epidemic in the city of Erie followed, which was participated in by Dr. A. A. Woods, health officer of Erie. The minutes of the previous meeting, copies of which had been placed in the hands of each member at the opening of the meeting, were taken up and a number of verbal alterations were suggested by the Chairman.

With these alterations the minutes as read were approved.

The Board then adjourned.

(Signed) BENJAMIN LEE,
Secretary.

Minutes of the Twenty-first Regular Meeting.

The twenty-first regular meeting of the Board was held at Harrisburg, May 13, 1892, at the Supreme Court room at 8 p. m. . Twenty-first regular meeting.

Present, Dr. J. H. McClelland, President, in the chair. Howard Murphy, C. E., Dr. J. F. Edwards, Dr. Pemberton Dudley, Dr. George G. Groff and Dr. Benjamin Lee, Secretary.

The President made a few appropriate remarks on again meeting the Board after an absence of several months in Europe. He had just had an interview with His Excellency Governor Pattison, who had requested him to summarize his observations on foreign sanitary methods and submit them to him for his information. He had promised to do this through the State Board of Health.

The Secretary stated that Dr. S. T. Davis had written regretting that he would not be able to be present.

An order of business presented by the Secretary was adopted as the order of the day. Order of business.

On motion of Dr. Groff it was resolved that in reading the minutes of the last meeting only the headings

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of that portion prior to new business be read, but that from this point the minutes be read in detail.

Minutes of special meeting approved.

The minutes of the special meeting held March 28, 1892, on the train between Williamsport and Erie, and at the city of Erie, were then read as above indicated and approved.

The Secretary then presented his report as follows:

Secretary's report.

The Secretary begs leave respectfully to report that the following matters which were referred to him for action at the last meeting have received his attention, namely:

Pure food bill.

The endorsement of the Pure Food Bill now before Congress.

Relations to Mexico

The establishment of relations with the Superior Board of Health of the Republic of Mexico.

Membranous croup.

Recommendation to the Board of Health of Lancaster with regard to classing membranous croup as a contagious disease.

Baggage from infected ships.

Communication to the Health Officer of New York, with reference to the disinfection of baggage on infected ships.

Resolution commending the public spirited action of Mr. Gillingham, of Villa Nova, in sacrificing his herd on account of tuberculosis.

Resolution deprecating the action of the councils of Lock Haven in dissolving the City Board of Health.

Reference of the question of the danger of typhus fever from Mexico, to the National Conference of State Boards of Health.

Request to the Adjutant General of the State for hospital tents to be used as emergency hospitals.

The following is a resume of the official acts of the Secretary since the last meeting.

Sanitary inspection of Erie.

1. Immediately after the adjournment of the Board at Erie, on March 31, accompanied by the members and medical inspectors present and several city officials, he had made a sanitary inspection of that city, visiting the water works and following the general plan of the sewerage system. They found among other things that the sewerage of the city was so arranged as constantly to pollute the water supply, to a greater or less extent. A fuller report on this subject would shortly be received from the engineer member of the Board, who participated in this inspection and also made a special investigation subsequently.

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2. On the 24th of March small-pox was reported at Clarke's Valley, Schuylkill county. Dr. W. Murray Weidman, Medical Inspector of the Schuylkill district, was at once instructed to investigate, and to enforce stringent precautions if the report were found correct. He verified the diagnosis of the attending physician, Dr. E. Phillips, of Tower City, and through his advice the patient and exposed persons were isolated at the cottage where the outbreak occurred. Five cases of confluent small-pox occurred in this family, three of which proved fatal. Dr. Weidman's report had only just been received, having been sent to Erie during the Sanitary Convention, and held there by mistake. Dr. Phillips now reported the disease as being stamped out, and the cottage thoroughly cleaned and fumigated. It was, however, proposed to fumigate the house again. The wise precaution had been taken of killing a cat and a dog which had been exposed to the infection.

Small-pox at Clarke's Valley.

3. A communication was read from the Chairman of the Committee on Legislation of the American Live Stock Association, the office of which is at Springfield, Illinois, with reference to needed State and National Legislation for sanitary purposes.

Sanitary Legislation for the protection of live stock.

The Secretary had replied stating that it was highly desirable that the states should adopt stringent regulations and legislation for the management of herds, the care of dairies and the protection of dairy products from a sanitary point of view, and that the right to condemn and slaughter animals discovered to be affected with contagious disease should be conveyed to appropriate responsible officers.

4. Dr. A. Müllhaupt, chairman of the St. Mary's School Board, Elk county, had requested the Secretary to inform him as to the length of time a school teacher who had had an attack of scarlatina should quarantine herself. He had replied that it would be unsafe for a teacher to resume her duties after an attack of Scarlatina within six weeks from the height of the disease, and then only on the certificate of a physician that desquamation was completed, and after proper fumigation of her room. He had also referred him to circular No. 33.

Quarantine of school teachers.

Referred to new business by request of Dr. J. F. Edwards.

5. A communication had been received from Dr. Z. Taylor Chrisman, of Warwick, Chester county, inquiring

Public funerals in contagious diseases

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as to the law governing the burial of bodies dead of contagious diseases. The church authorities of that place had prevented an attempt to hold a public funeral in the church in the case of a child which had died from diphtheria. In reply, the Secretary stated that the Legislature had hitherto refused to enact any law governing this subject. The Board had adopted a regulation which it was hoped would eventually have the force of the law, although it could not be enforced until it had been published in all the county towns. He cordially approved the action of the church authorities in this matter, and sent circulars No. 29 and 31 for distribution.

Diphtheria communicated by clothing exposed to membranous croup.

6. A sad case showing the infectiousness of diphtheria had occurred recently at Royer's Ford, Montgomery county. A parcel of clothing worn by a child which had died three months previously from "membranous croup" in Philadelphia, the child's father having died of so-called tonsilitis, about the same time, had been sent to a family at this place, the result being that cases of diphtheria occurred in the family, two of which proved fatal.

Invasion of Huns at Bridgeport.

7. A complaint had been received from Bridgeport, Montgomery county, that a large number of Hungarians were occupying a house in that village, the lower rooms of which were being maintained in such a filthy condition as to be little better than a pig-sty. The Secretary had replied that the burgess possessed ample power to remedy these insanitary conditions, and sent copies of the Model Ordinances, the adoption of which he urged.

National Conference State Boards of Health.

8. The Secretary stated that the questions for discussion at the National Conference of State Boards of Health at Lansing, in June, which he suggested in behalf of the Board, were as follows:

"In view of the increasing frequency of communication between the Republic of Mexico and the United States, and the constant prevalence of typhus fever in the former country, is there such probability of the introduction of that disease into the United States as to make it important for health officers along the Southern frontier to use especial vigilance on that account?"

"Is the disinfection of baggage essential to effective quarantine?"

Small-pox at Titusville.

9. The case of small-pox reported at the last meeting at Titusville, Crawford county, in the person of an emigrant child which had arrived at New York two weeks previously on the steamer "Diana," and which was therefore

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reasonably supposed to have been caused by infected clothing, had recovered. The Board of Health had promptly isolated the case, adopted the precautions recommended in the circular of the State Board, and stamped out the disease. The Health Officer of the port of New York had been communicated with, in accordance with the resolution then adopted on the subject of the disinfection of the baggage of immigrants landing from steamers on board of which contagious diseases had occurred.

Piggery nuisance at Chestnut Hill.

10. A report of a nuisance from a piggery at Chestnut Hill, Montgomery county, causing sickness at the Bethesda Home for Friendless Children, had been received. The Secretary had sent the usual forms for affidavit but no further complaint had been made.

Inspection at Ogontz.

11. A complaint that diphtheria existed in a house at Ogontz, Montgomery county, was reported at the last meeting. Deputy Medical Inspector Cooper had also reported that a toll house immediately adjoining the house in which two fatal cases of diphtheria had occurred was in a very insanitary condition in every respect, and Medical Inspector Atkinson was instructed to visit the place. His report corroborated Dr. Cooper's statement, that it was unfit for habitation, and he condemned the building, urging its removal. He also pointed out that a neighboring swamp required drainage, being likely to cause malaria. Since this inspection the Secretary had been advised by the local inspector that the toll house had been vacated preparatory to its demolition the swamp in question drained and other sanitary defects remedied.

Pollution of canal basin at Muncy.

12. A complaint had been received from a resident of Muncy, Lycoming county, that a canal basin at that place was being polluted by refuse from a woolen mill, causing a sickening odor, and he thought much sickness. Dr. Groff stated that he knew the locality well and did not think this a very serious matter. The Secretary had replied, stating that the borough authorities had ample power to abate such a nuisance and advising that men be elected to office who value human life more than dollars and cents. He also sent the usual forms for complaint.

Infectiousness of dead bodies.

13. A physician of Selinsgrove, Snyder county, had written with regard to a transportation permit for a child which had died of scarlet fever five years previously, inquiring how long after burial in such a case the Board

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considered that a body was capable of conveying infection. He had refused a certificate in this case, but the parents were willing to have the body sealed hermetically. In reply the Secretary stated that the Board had never adopted any formal decision covering this question, and he doubted whether it were possible to do so. His own belief was that infection was possible until decomposition was complete. If, however, the parents were willing to follow the stringent precautions specified in his letter, he would grant the necessary permit. This assurance was given and the permits for this body, as also for an infant, were granted.

Referred to new business.

Small-pox in Pittsburg.

14. Mr. W. F. McKelvy, Superintendent of the Bureau of Health of Pittsburg, had recently reported three cases of small-pox in that city, two of which were still under treatment. The cases were promptly isolated, premises disinfected and vaccination performed.

Establishment of Board of Health.

15. On request of a physician of McKeesport, the Secretary had sent documents, rules and regulations to him, and a Board of Health had been established in that borough.

Bacteriological exhibit at World's Columbian Exposition.

16. The Secretary had communicated with Dr. John S. Billings, of Washington, D. C., as to whether it were practicable to make a bacteriological exhibit at the World's Fair. Dr. Billings had replied that such an exhibit for three weeks would probably cost from $1,000.00 to $1,200.00. He suggested that a complete portable apparatus, costing about $150.00, free of duty, might be purchased by the Board, which could be shipped from place to place as required throughout the State. This could form a portion of the exhibit of the Board at the World's Fair, and would undoubtedly be of much interest to other health organizations. The Secretary had, therefore, made a requisition for a set of apparatus for examining potable waters, on the Secretary of the Commonwealth. Should this fail to be honored he would ask the Board for permission to purchase such an outfit.

Referred to new business.

A Society for Prevention of Tuberculosis.

17. The Secretary reported that a Society for the Prevention of Tuberculosis has just been formed in Philadelphia. It was organized April 22, and held its first meeting May 6. The society included several well-known medical and other residents of Philadelphia of both sexes.

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18. At the request of Mr. Howard Murphy, the consideration of the Devon Inn drainage question was referred to new business. Inspection of Devon Inn.

19. By request an inspection had been made at New Hope, Bucks county, by Medical Inspector Atkinson, owing to an outbreak of typhoid fever, which had attacked an entire family. The inspector reported that all the cases recovered after several weeks' illness. He found that the well of water used for drinking purposes had been contaminated by roof and surface drainage. Dr. Leffman, on examining a sample of this water pronounced it unfit for use. The inspector recommended the remedying of certain sanitary defects as regards cesspools and privy, which were agreed to. The well which had caused the mischief had been thoroughly cleansed. Inspection of New Hope.

The President at this point stated that he had received a complaint, respecting a nuisance at Homewood, a suburb of Pittsburg, which he had omitted to bring to the meeting. The matter was referred to the Secretary for action.

20. His Honor the mayor of Lebanon (Mr. J. W. Harbeson) had suggested to the Secretary the expediency of establishing a "sanitary day" in May and one in September of each year, throughout the State. He considered that such action would benefit the State more than the "Arbor Days." The Secretary had replied that while he approved the suggestion, he thought such action should emanate from the Legislature, the Board of Health being the youngest, and in the opinion of many, the least important department of State Government. To this His Honor answered that his meaning was that the Board should suggest the step to the Legislature, and that his opinion of the value of a health department differed from that too often held. Sanitary days.

Referred to new business.

21. Dr. Heber Robarts, Health Officer of Butte City, Montana, had communicated with the Secretary asking his opinion as regards the shipment of undrawn fowls. The Secretary had replied that the best evidence he had been able to obtain on the subject favored the view that undrawn poultry was less likely to become infected with the bacteria of putrefaction than that which had been drawn, thus exposing cut surfaces through which absorption could more readily take place. Poultry shipped.

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Notification of arrival of infected immigrants at New York.

22. The Secretary submitted a list of steamships which had arrived at the port of New York since the last meeting, on board of which there had existed contagious diseases, as received from the Commissioner of Immigration. The burgesses and health authorities throughout the State had been notified of the arrival of immigrants at their several towns per such steamships, except in the cases of measles which he had notified the Commissioner he need not in future report.

Referred to new business.

Notification of infected immigrants, Philadelphia.

23. The Secretary stated he had requested the Commissioner of Immigration for the port of Philadelphia to notify him in regard to the arrival of infected steamships, as was done by the New York Commissioner. No reply had as yet been received.

Drowning circular.

24. Circular on the "Treatment of the Apparently Drowned."

Cir. on S. P. A.

25. Circular on "Sanitary Protective Associations."

Circular on prevention of blindness.

26. Circular on the "Prevention of Blindness." The Secretary reported that all these circulars were in the hands of the printer, and would shortly be issued.

Board of Health of Bradford.

27. The Secretary presented the report of the Board of Health of Bradford, McKean county.

Referred to new business.

Board of Health of Reading.

28. The report of the Board of Health of the city of Reading, Berks county, was also laid before the Board. The Secretary desired to call especial attention to the admirable report on school hygiene which it contained, by Dr. A. B. Dundor, member of the Committee on School Hygiene. Mr. Howard Murphy, C. E., suggested that the Secretary request that a copy of this valuable report be obtained for each member of the Board.

Inspection at Lansdowne.

29. A report of an inspection in regard to the disposal of the contents of a cesspool at Lansdowne made by Medical Inspector Atkinson was read. The inspection revealed the fact that while the complaint was well founded, every resident in Lansdowne who found it convenient adopted a course quite as objectionable in getting rid of his drainage. An abatement of this nuisance was ordered.

Inspection of military academy.

30. A somewhat alarming outbreak of typhoid fever at the Chester Military Academy had resulted in an inspection of that institution by Medical Inspector Atkinson, made in company with Dr. John S. Billings, United States Army, director of the Laboratory of Hygiene of

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the University of Pennsylvania and Dr. A. C. Abbott his assistant. Dr. Atkinson reported that no local cause was found for the outbreak. The water used at the academy was being examined at the Laboratory of Hygiene of the University of Pennsylvania. It was the opinion of the inspectors that the students had probably acquired the disease outside of the institution.

Passage of food and drugs adulteration bill.

31. The food and drugs adulteration bill, referred to at the last meeting had successfully passed the Senate at Washington, and was now before the House.

Special report on food adulterations.

32. The Secretary presented a special report on the extent and character of food adulterations received from the United States Department of Agriculture. This report was referred to the Committee on Adulterations, Poisons, Explosives and other Special Sources of Danger to Life and Limb.

Written communications.

33. The total number of written communications received by the Secretary since the meeting in November last was 1,208, and the total number sent 948.

Circulars distributed.

34. The total number of circulars issued since the meeting in November was 15,939, and of boxes of complete sets of circulars, 1,032.

Additions to library.

35. There had been added to the library during the same period fifty-eight books and fourteen pamphlets. Of this number, forty nine books had been received as exchanges and nine had been purchased. Thirteen pamphlets had been received as exchanges and one purchased.

Reports of standing committees being now in order: The Executive Committee (Dr. Pemberton Dudley, chairman), reported that it had held three meetings since the last regular meeting of the Board, at which accounts represented by vouchers Nos. 487 to 524 had been audited and approved, the amount expended having been $2,018.97. The report was accepted and approved.

Reports of standing committees.

Dr. Benjamin Lee, chairman of the Committee on Registration and Vital Statistics, reported that a recent investigation into the question of the mortality from tuberculosis in Philadelphia by Lawrence F. Flick, M. D., showed a decided and progressive diminution of percentage of mortality from this disease since the year 1885, when the doctrine of its contagiousness began to be generally adopted.

The report was approved and accepted.

Dr. J. F. Edwards, chairman of the Committee on Prevention of Disease, Disinfection and Supervision of

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Travel and Traffic, stated that as editor of the "Annals of Hygiene" his committee made a report through that organ every month, and he had therefore no special report to present. The statement was accepted.

Mr. Howard Murphy, C. E., chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, reported verbally that with regard to the inspection at Erie plans of the sewerage system and water works had not as yet been obtained, and he was not, therefore, in a position to make a complete report on this subject. He would, however, request the Board under the head of new business to forcibly express itself against this system of having the outfall of the sewerage so dangerously near the intake of the water mains.

Referred to new business.

With regard to the Devon Inn drainage case, he would also prefer that to be referred to new business.

Referred to new business as desired.

The subject of abandoned canal beds in Pennsylvania, referred to his committee at the last meeting, had received some attention. He had conferred with one of the head officials of the Pennsylvania Railroad Company in the matter, but was not yet fully prepared to report thereon. He had conferred with Dr. Henry Leffmann with reference to obtaining samples of water for analysis. There had been considerable risk in getting these specimens of water conveyed safely on the railroads, owing to employes tampering with them. Dr. Leffmann now proposed to have all these demijohns enclosed in cases with padlock attached. He would request that the question of appointing two engineer inspectors be referred to new business.

Referred accordingly.

The report was accepted with the suggestion that it be reduced to writing and sent to the Secretary.

Dr. George G. Groff, chairman of the Committee on Public Institutions, reported verbally. He suggested that Nos. 26 and 33 circulars on school hygiene be revised so soon as the present editions were exhausted. The matter of revision of these circulars was referred to new business.

The report was approved with the request that it be reduced to writing and submitted to the Secretary.

Dr. Pemberton Dudley, chairman of the Committee on Adulterations, Poisons, Explosives and other Special

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Sources of Danger to Life and Limb, reported verbally that the question of the ingredients used in coloring butter had been investigated to some extent. He found that the coloring of butter by anatto was probably not injurious to health, there being only a few drops used in a churnful of butter.

The report was approved with the request that it be reduced to writing and submitted to the Secretary.

Report of Committee on Sanitary Convention.

Reports of special committees being in order the Secretary presented the report of Dr. S. T. Davis, chairman of the Committee on Sanitary Convention.

The report stated that the sixth annual sanitary convention, held at Erie, March 29 to 30, had been one of the most successful conventions yet held. Great credit was due the Secretary and the gentlemen composing the local committee in having arranged such an excellent program.

The committee suggested that the proceedings form a portion of the annual report of the Board.

The annual address before the Board was delivered by Dr. Peter H. Bryce, of Toronto, Secretary of the Provincial Board of Health of Ontario, and was listened to with deep interest by a large audience. Erie had gone on record as the first city, since the inauguration of the Board in Philadelphia, that had offered a banquet to the members of a sanitary convention.

Presentation of accounts.

The Secretary then presented accounts, vouchers numbered 523 to 524, amounting to $102.81, which had been audited and approved by the Executive Committee. The accounts were on motion approved.

New business.

New business being in order Dr. Pemberton Dudley offered the following resolution:

Tuberculosis in penal institutions.

WHEREAS, Modern researches have demonstrated the contagious character of lung tuberculosis (consumption);

And whereas, This disease is known to be unduly prevalent in the penal institutions of this and other States; therefore,

Resolved, That the Committee on Public Institutions and School Hygiene, in conjunction with the Secretary, be requested to consider the expediency of formulating instructions to the authorities of the prisons, jails and reformatories of this State by which to secure precautions for preventing the spread of the disease among their inmates.

The resolution was adopted.

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Dr. J. F. Edwards, Chairman of the Committee on Preventable Diseases, Disinfection and Supervision of Travel and Traffic, moved that the correspondence relating to the consideration of the quarantine of school teachers, public funeral in contagious diseases, the length of time a body dead of contagious disease will continue to be infectious, and "sanitary days," as proposed by the mayor of Lebanon, be referred to this Committee with instructions to subsequently report thereon.

The correspondence on these subjects was referred accordingly, the Committee to report on the same at its convenience, except with regard to the establishment of "sanitary days," on which subject it was instructed to report at the next regular meeting.

On the motion of Mr. Howard Murphy, C. E., it was ordered that a copy of the minutes of the previous meeting be sent to each member of the Board, together with the copy of the order of business prior to each meeting. On motion of the same gentleman the Secretary was requested to ask the Board of Health of the city of Reading to furnish each member of this Board with a copy of their last annual report containing Dr. A. B. Dundor's valuable report of school inspection.

Devon Inn drainage.

The subject of the Devon Inn drainage was now called up by Mr. Howard Murphy, C. E., for consideration. He read the report of Medical Inspector Atkinson, made April 19 last. The inspection revealed the fact that little of an effective character had been done to abate the long standing nuisance, and the inspector felt compelled to renew his "condemnation of the entire place" so far as its drainage system was concerned. This matter had now been under the Board's consideration for over two years. Owing to the removal of the outlet to a point below the property of Mr. C. Davis English, who had been the chief complainant, and the partial abatement of the nuisance so far as his premises were concerned, that gentleman might possibly be ready to withdraw his complaint. This did not, however, relieve the Board of its responsibility in the matter. A conference between the engineers who had been consulted in this matter and himself at New York had been proposed, but nothing had been done. He would suggest that the question remain in abeyance a little longer, and then if the orders of the Board had not been obeyed the Secretary carry

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out his instructions and institute legal proceedings against Messrs Coffin & Altemus, the owners.

In regard to the nomination of Engineer Inspectors Mr. Howard Murphy stated that he had deferred acting on behalf of his committee in consequence of the absence of the President in Europe, as he desired that gentleman to make a nomination for the western part of the State. He moved that nominations for the two Engineer Inspectors be now made. It was carried.

Nomination of Engineer Inspectors.

The President proposed the name of Colonel T. B. Roberts, C. E., of Pittsburg, as Engineer Inspector of the Board for the western part of the State.

Mr. Howard Murphy, C. E.. proposed the name of William H. Boardman, C. E., of Philadelphia, as Engineer Inspector of the Board for the eastern part of the State. The nominations were, on motion of Dr. Dudley, approved, and the President announced the nominees duly elected as Engineer Inspectors of the Board.

In regard to his action in relieving the United States Commissioner of Immigration from the labor of issuing notifications to him on the arrival of steamships infected with measles only, the Secretary had stated that he had done so for two reasons: First, because of the comparatively low mortality rate of that disease, and, secondly, because he felt that to attempt impossibilities is to invite ridicule and forfeit public confidence. While he believed that something might be accomplished in the prevention of scarlet fever, diphtheria and small-pox by this means, measles was already so universally prevalent that it was useless to make efforts to shut it out.

At the request of Mr. Howard Murphy, C. E., the President transferred his name from the Committee on Public Institutions and School Hygiene to the Committee on Adulterations, Poisons, Explosives and other Special Sources of Danger to Life and Limb, and that of Dr. J. F. Edwards from the latter Committee to the former.

On motion of Dr. Pemberton Dudley it was

Resolution on water supply of Erie.

Resolved, That the reports of the Secretary and of the Chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, on the water supply and sewerage of the city of Erie, leave no doubt in the minds of the members of this Board that the water supplied to the citizens for household purposes is constantly polluted to some extent and frequently seriously contaminated, and that the close proximity of the outlet of the

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principal sewer to the intake of the pumping station is fraught with great danger to the health of the city.

Resolved, That in the opinion of the Board the body of water known as the harbor is of too limited capacity and too sluggish flow to constitute at once a receptacle of sewage and a source of water supply.

On motion of Dr. Groff, Chairman Committee on School Hygiene and Public Institutions, it was ordered that circulars Nos. 26 and 33 on School Hygiene be revised so soon as the present editions are exhausted.

Adjournment.

The Board then on motion adjourned.

BENJAMIN LEE,
Secretary.

Minutes of the Board.

Twenty second regular meeting.

The twenty-second regular meeting of the Board was held at the Supreme court room, Harrisburg, July 11, 1892, at 4 p. m.

Members present.

Present: Dr. George G. Groff, Dr. J. F. Edwards, Dr. Pemberton Dudley, Dr. Samuel T. Davis, Mr. Howard Murphy, C. E., and Dr. Benjamin Lee.

A telegram was read from Dr. J. H. McClelland expressing his regret at being unable to be present.

In the absence of the President, on motion of Mr. Howard Murphy, C. E., Dr. George G. Groff was called to the chair.

Order of business.

An order of business presented by the Secretary was adopted as the order of the day.

Approval of minutes.

The minutes of the last regular meeting, held at Harrisburg, May 13, 1892, and of a special meeting, held at the executive office, Philadelphia, June 29, 1892, were read and approved.

Report of the Secretary.

The Secretary then presented his report, which included the following items:

Appointment of Engineer Inspectors

1. Appointment of Engineer Inspectors. Immediately after the adjournment of the last regular meeting, the Secretary conferred with the Chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, with reference to the districting of the State for the purpose of inspection by the Engineer Inspectors. The result arrived at was that the most natural and convenient division for this object would be that indicated by the natural water-sheds of the State, which would

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make the ridge of the Allegheny mountains the dividing line between the eastern and western districts. This matter having been decided, the Secretary forwarded to William H. Boardman, C. E., of Philadelphia, Engineer Inspector of the Eastern district and Colonel Thomas P. Roberts, C. E., of Pittsburg, Engineer Inspector of the Western district, their respective certificates of appointment, which were suitably acknowedged by them in the accompanying letters.

Mr. Howard Murphy, C. E. requested that this subject be referred to new business.

Typhoid fever at Homewood.

2. A report that typhoid fever was prevailing to an alarming extent at Homewood, Allegheny county, had been received and investigated. Medical Inspector Thompson reported Homewood to be an outlying ward of Pittsburg, and Mr. W. F. McKelvy, the Superintendent of the Bureau of Health of that city, to whom the complaint was then referred, stated that the trouble was receiving attention, but had been greatly exaggerated.

Tents for emergency hospitals.

3. In accordance with instructions, the Secretary had made application to Adjutant General W. W. Greenland to set apart a number of tents to be used as emergency hospitals during the prevalence of epidemics. His reply, which was now read, was to the effect that the canvas had been purchased for the use of the National Guard, and he did not think it within his province to divert it, but that it could be had in emergencies as on former occasions.

Typhoid fever at South Fork.

4. Medical Inspector Matthews and Mr. Sloan, health officer of Johnstown, both reported a serious epidemic of typhoid fever to be prevailing at South Fork during May last. Demijohns were sent the burgess for specimens of water for analysis. Dr. Henry Leffmann reported the water to be contaminated, and on the advice of the Secretary its use was discontinued.

Diphtheria at Erie.

5. In regard to the epidemic of diphtheria which had prevailed at Erie during the past winter, the Secretary, on the urgent request of Medical Inspector Woods, who was the health officer, sent instructions ordering both the public and private schools closed. A copy of these instructions was read. The schools were closed within four days of the issue of the order, and the epidemic began to diminish immediately. With reference to the issuing of a regulation on this subject, the matter was referred to new business.

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Taking of oaths by members of Boards of Health and officers.

6. A request for advice as to the taking of an oath by members of a Board of Health or health officer had been received from Phœnixville. The Secretary in his reply advised that if Phœnixville was a city there could be no doubt of the necessity of the members of the Board and of the health officer being sworn in. If a borough, there was no law upon the subject, unless so provided in the special act of assembly conferring the charter. He was in favor of the taking of an oath, as it gave an officer authority and prestige in the eyes of the public.

7. A telegram was received on May 30th from Dr. H. W. Cole of Hazleton, stating that a fatal case of typhus fever had occurred at that place. The necessary suggestions in such a case were sent at once by the Secretary. The health officer of New York city was also immediately notified of the case. He replied that no case of this nature had passed through that city since the steamship "Masillia's" arrival and he was quite unable to explain how such a case had got into Pennsylvania, unless through some other port.

Action with reference to floods at Titusville' Oil City and Meadville.

8. Intelligence of the terrible destruction to life and property at Titusville and Oil City on the 5th of June reached the Secretary at Detroit on June 6th. He at once telegraphed to His Excellency the Governor inquiring whether the information in his possession led him to consider that the interference of the State Board of Health was necessary or desirable, and to the mayors of these cities inquiring whether tents were needed. A medical inspection of the regions affected was also ordered, and the boards of health were asked whether they needed assistance to meet the emergency. The replies of the Governor and the other officials indicated that the local boards of health and authorities were able to cope with the emergency. This was shortly afterwards confirmed by the report of Medical Inspector Woods.

On the 10th of June the Secretary visited Oil City and conferred with the mayor and Board of Health. Accompanied by the President of the Board of Health a careful inspection of the entire district was made, and every provision was found being made for the prevention of nuisances and care of the injured. A similar inspection of the Titusville region affected was also made a few hours afterwards in the company of the president of the Board of Health of that city. Much admirable work

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had also been done here by the local board, but the immense area involved, and the low lying character of the district presented considerable difficulty to the authorities in abating the nuisances here. About 400 men were actively at work in the removal of debris, application of disinfectants, construction of drains and the opening of thoroughfares. The efficient manner in which these two Boards of Health had met such an overwhelming disaster was a convincing proof of the need of the compulsory establishment of Boards of Health throughout the entire State.

After carefully examining the causes of the disaster by fire in both of these instances, the Secretary was impressed with the fact that oil tanks or refineries should no longer be permitted in exposed positions on the banks of streams where they are liable to be undermined and swept away.

Inspection at Meadville.

While at Titusville the Secretary was requested by wire to visit and inspect Meadville, portions of which had also been flooded. The flood here had left much offensive debris, but the Board of Health had been taking admirable precautions to prevent any result prejudicial to the health of the city. The conditions at this city are somewhat peculiar as regards dangers from floods. Considerable engineering work and pecuniary outlay will be necessary and are essential to prevent constantly recurring catastrophes. The Secretary declined, however, to promise State aid in the matter. A difficulty having arisen in the city council with regard to the authority of the Board, the Secretary sustained them in all that they had done and advised them to continue in their important work regardless of opposition.

National Conference of State Boards of Health. Report of Secretary as delegate.

9. The Secretary had attended the eighth annual conference of State Boards of Health at Lansing, Michigan. A programme of the proceedings was laid before the Board. The special subject on which he had been directed to report at this conference was the pollution of streams. A cyclostyle circular requesting data with regard to the pollution of streams throughout the United States and Canada, asking for copies of the laws (if any) of each State and Province on the subject, and inquiring whether they favored legislative action by Congress in regard to this question, or whether they considered it rather desirable that the principal streams be used as sewers and supplies of drinking water be obtained from

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other sources, had been sent to all the State and Provincial Boards of Health in the United States and Canada. Several of the Southern agricultural states were in favor of the latter, while the Northern states generally favored Congressional action.

A copy of this circular and the replies to the same were placed before the Board.

The question of the incorporation of this matter in the annual report was referred to new business.

Small-pox at Pittsburg.

10. An outbreak of small-pox had occurred at Pittsburg. The total number of cases reported by the Superintendent, Mr. F. W. McKelvy, to June 18, was five. The usual precautions had been adopted and notifications sent.

Small-pox at Coudersport, Potter county.

11. A somewhat serious outbreak of small-pox had occurred at a tannery, just outside Coudersport. In consequence of the absence, illness or urgent professional engagements of several of the Medical Inspectors, considerable difficulty had been experienced by the Secretary in obtaining the services of an inspector. Ultimately Dr. J. R. Thompson, Medical Inspector of the Allegheny district, was secured. He reported that owing to an opinion expressed by one of the resident physicians there had been doubt as to whether the cases were true small-pox or not. He found seven cases of discrete small-pox, confined to two families. One case proved fatal. The disease originated in a Polish family named Pullaskie, six of the cases having developed from the first fatal one. The patients were removed and isolated in a pest house and every precaution as to disinfecting the houses, boiling and burning of clothing taken. No further cases had resulted up to the present time. The report of these cases was made to the Secretary by C. H. Armstrong, burgess; Mr. James L. Knox, of Coudersport, and Dr. Fisher, of Roulette.

Resignation of Dr. E. D. Payne.

In consequence of being unable to make this inspection through illness, and of permanent ill health, Dr. E. D. Payne, the Medical Inspector for the Lycoming district, had felt compelled to resign.

Small-pox at Mill Creek, Luzerne county.

12. On the 30th of June Dr. L. H. Taylor reported a case of small-pox at Mill Creek in the person of a Hungarian immigrant only fourteen days in the country. The patient had come from Antwerp, but the name of the vessel could not be ascertained. The poor directors

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were communicated with and the case promptly quarantined in a pest house erected for the occasion.

13. A report of a case of variola at Garland, Warren county, had also been received from Dr. A. A. Woods, but no further information had yet been received from him.

Variola at Garland, Warren county.

14. Since the last regular meeting eight steamships infected with small-pox had arrived at New York. A list of these and of steamships infected with other diseases arriving at that port was read, viz:

Small-pox on vessels arriving at New York.

S. S. "Belgenland," May 14, small-pox and measles.
S. S. "City of Chicago," May 25, scarlet fever.
S. S. "Aurania," May 26, small-pox.
S. S. "America," May 27, scarlet fever.
S. S. "Dresden," June 1, measles.
S. S. "Ethiopia," June 1, measles.
S. S. "Bremen," June 2, small-pox.
S. S. "Siberian," June 4, scarlet fever and measles.
S. S. "Schiedam," June 11, small-pox.
S. S. "Bohemia," June 14, scarlet fever.
S. S. "P. Calland," June 16, small-pox.
S. S. "American," June 17, small-pox.
S. S. "Saale," June 27, small-pox.
S. S. "Waesland," June 28, small-pox.

15. Since the last regular meeting 175 notifications of the existence of small-pox and other contagious diseases on board steamships arriving at the port of New York had been sent to the burgesses or Boards of Health of towns throughout the State to which immigrants on such vessels were destined.

Notifications to Boards of Health and burgesses.

16. The Secretary read a communication from the United States Commissioner of Immigration at the port of Philadelphia, stating that notifications of the arrival of infected steamships at that port also would be sent to the Board.

Notification of arrival of infected vessels at Philadelphia.

17. A complaint had been received of the prevalence of a diphtheria epidemic at Seven Valley, York county. Circulars and advice had been sent.

Diphtheria at Seven Valley.

18. The Secretary had received official notifications of the establishment of Boards of Health at Hazleton, Luzerne county, and at Shippensburg, Cumberland county. In each case full sets of documents, including Board of Health rules and regulations, had been forwarded.

Boards of Health established.

19. Dr. A. F. Balmer, president of the school board of Brookville, Jefferson county, had requested the advice of

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Papering of school houses.

the Secretary as to the papering of the walls of school rooms. The Secretary had replied that such a system would be prejudicial to the health of the pupils of such schools. Where large numbers of individuals are crowded into comparatively small rooms, the ventilation of which is frequently imperfect, paper soon becomes saturated with exhalations from the lungs and pores of the skin, and thus become a vehicle for the propagation of disease. For the walls of country school houses whitewash, or next to that a hard paint or glaze was recommended.

Defective drainage at Muncy.

20. A complaint of defective drainage at Muncy, Lycoming county, had been referred to Dr. Geo. G. Groff. Dr. Groff stated verbally that he had not yet had time to make the inspection. The report was therefore deferred.

Recess.

The Board then took a recess and reconvened at 8 p. m. at the Bolton House, when the Secretary's report was continued.

Delegate to meeting of American Public Health Association.

21. A letter from Dr. Felix Formento, President of the American Public Health Association, to His Excellency Governor Pattison, urging that the executive officer of this Board should represent the State at the next meeting of the Association, which had been referred to the Board by the Governor, was read. The meeting would be held in the city of Mexico from November 29th to December 2d next. The matter was referred to new business.

Slaughter house nuisance at Greensburg.

22. A complaint of a filthy slaughter house at Greensburg, Westmoreland county, had been made. The Secretary wrote to the owner and proprietor that if the nuisance were not promptly abated he should direct the district attorney to prosecute him. This had the desired effect, as he had replied promising compliance with the Board's regulations.

Registration powers of borough councils.

23. A communication had been received from a physician of Steelton, and from the borough council of Shamokin with reference to the powers of a borough council in enforcing the registration of Vital Statistics. In his replies the Secretary had taken the ground that if a borough council considered it essential to the protection of the public that they should possess the knowledge of the health conditions of the borough, furnished by registration, they had full powers to enforce such registration, although there was no act of the Legislature specifically conferring this authority.

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24. A nuisance arising from stagnant pools at Morrisville, Bucks county, had been complained of. The Secretary had communicated with the burgess upon the subject. The reply made through borough council was to the effect that the nuisance complained of was a private one, with which the corporation was advised not to interfere. The Secretary had replied approving the decision and stating that the same course was pursued by the Board with regard to private nuisances. Nuisance at Morrisville.

25. A complaint of the insanitary condition of certain properties at Highland avenue, near Wayne, Delaware county, had again been received. Mr. R. H. Johnson, one of the contractors, had replied stating that he was anxious to comply in every respect with the Board's orders. He denied that any nuisance existed on the property over which he had control. The other parties who were probably the chief offenders had as yet sent no reply. Insanitary conditions at Highland avenue near Wayne.

26. Complaints of minor nuisances had been received from Greensburg, Westmoreland county; Trainer, Delaware county; Millville borough, Allegheny county; Oakdale station, Allegheny county; Mount Clair, Montgomery county; Phœnixville, Chester county; West Bellevue, Allegheny county, and Birdsboro, Berks county. No reply to the usual forms which had been sent in these cases had yet been received, except in the Birdsboro case. This complaint referred to the water supply, and was referred to new business. Complaints of minor nuisances.

27. Proposed drainage system for Darby Creek Valley. The Secretary briefly reported that the neighborhood of the proposed outfall of this system was inspected by the Board on the 29th of June. A fuller report would be made by the Chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines. Darby Creek Valley sewerage scheme.

28. A list of the disinterment permits issued since the last regular meeting was presented. Disinterment permits issued.

29. The total number of communications received since the last regular meeting had been 322, and the total number sent out 300. Communications received and sent.

30. Three circulars had been issued since the last regular meeting, viz: Precautions Against Trichinosis (revised), No. 22. The Treatment of the Apparently Drowned or Suffocated, No. 34. Sanitary Protective Associations, No. 36. Circulars issued.

31. The total number of loose circulars distributed Circulars distributed.

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since May 13 last was 1,108, and the number of boxes of circulars, 203. As each box contained 18 circulars, the total number was 4,762.

Additions to library.

32. Additions to library, books 21; pamphlets 7.

This concluded the Secretary's report, which was on motion approved and adopted.

Reports of standing committees.

Reports of standing committees being in order

1. Dr. Pemberton Dudley, Chairman of the Executive Committee, reported that since the last regular meeting on May 13, 1892, one special meeting of that committee had been held, at which vouchers numbered 524 to 536 were examined and approved, amounting to $393.75. The report was approved and accepted.

2. Dr. Benjamin Lee, Chairman of the Committee on Vital Statistics, reported that the register of physicians of Philadelphia, just received, showed that 274 physicians had registered during the year ending July 1st instant, and that twenty-nine physicians had died during the same period in that city. The report was approved and accepted.

3. Dr. J. F. Edwards, Chairman Committee on Preventable Diseases and Supervision of Travel and Traffic, asked permission to report verbally on the subject of "Sanitary Days," which was one of the matters specially referred to this committee at the last regular meeting, with a request to report on same at this meeting. He was not yet in a position to submit a full report. He had communicated with the secretaries of thirty-seven State Boards of Health in the United States and Canada, and had received nineteen replies to date. Twelve of these replies cordially endorsed the proposal of a Sanitary Day; four did not approve of such an idea, and two or three were non-committal on the subject. The report was approved.

In the discussion which followed, it was generally felt that if the public school authorities and State Board of Education could be induced to take an interest in the proposed scheme, much good would probably result.

4. Mr. Howard Murphy, C. E., Chairman of Committee on Water Supply, Sewerage, Drainage, Topography and Mines, reported verbally that the matter of the imperfect drainage of the Devon Inn had now been before the Board at least two years. This delay was affecting other matters of a like nature throughout the State. He referred briefly to the before-mentioned conference at New

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York city on this subject, and stated that if an efficient drainage system could be devised it would be far better to adopt it at once. The proposal of the Darby Creek Sewerage Company in the drainage scheme inspected by the Board on June 29th, was to include all the towns and villages on the Pennsylvania railroad between Bryn Mawr and Berwyn, and would mean the construction of from ten to fifteen miles of sewerage, the outfall being near Garretville. Below that point the Darby creek was already much contaminated by refuse from several mills; in fact the water closets belonging to some of these mills were situated directly over the stream. He thought the disposition of the Board should be to encourage the gentlemen who were promoting this scheme, which would be a large and expensive work, and which would provide drainage accommodation for an estimated population of twenty-five thousand people. On the other side of the divide a pumping system could be introduced which would provide for a large amount of the drainage which now finds its way into the Schuylkill river. If this stream could be thus protected, it would result in great benefit to the city of Philadelphia. The members of the pro posed company, naturally, did not wish to proceed with this scheme, and after getting all in readiness at a large outlay, to have the State Board of Health condemn the system and declare it a public nuisance. He would recommend the proposed point of outfall in preference to carrying it to tidewater, as it would afford a better opportunity for aeration and dilution. The further consideration of the subject was referred to new business.

Mr. Murphy further reported that the drainage systems of the city of Erie and of the Norristown Insane Asylum were still under consideration.

On the motion of Mr. Howard Murphy, C. E., seconded by Dr. J. F. Edwards the condition of the sewerage system of the State Hospital for the Insane at Norristown was referred to the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, with instructions to carefully investigate the condition of the effluent, and report. The report of the committee was accepted.

5. Dr. George Groff, chairman of the Committee on Public Institutions and School Hygiene reported that the committee recommended that a copy of the resolution passed at the last regular meeting in regard to the contagiousness of consumption be sent, together with

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circular No. 28 to all penal institutions throughout the State. The report was accepted.

6. Dr. Pemberton Dudley, chairman of the Committee on Adulterations, Poisons, Explosives and other Special Sources of Danger to Life and Limb reported verbally that the proposed Paddock pure food bill was still before Congress. Several medical societies had adopted resolutions in favor of this bill, and the committee recommended similar action by this Board. Analyses of several of the so-called Cod liver oil emulsions had been made by Professor Henry Leffmann recently. The percentage of pure oil found in these emulsions varied from fifty to as low as ten, while one (Wampole's) was found not to contain any oil at all. The report was accepted.

7. Dr. Samuel T. Davis, chairman of the Committee on Sanitary Legislation, Rules and Regulations referred briefly to the approaching session of the Legislature. The committee recommended that a general bill for the organization of local Boards of Health; a bill for increasing the powers and the appropriation of the State Board of Health and other bills which had failed in previous sessions be introduced. Also that a circular be prepared and sent to every member of the Legislature setting forth the necessities of the State in the matter of sanitary legislation. The committee proposed later to hold a meeting for the drafting and formulating of these bills. The report was accepted.

Election of President for ensuing year.

VI. Nomination and election of a president for the ensuing year being in order, Mr. Howard Murphy, C. E., nominated the Hon. Samuel T. Davis, M. D., Dr. Pemberton Dudley seconded the nomination. On the motion of Mr. Howard Murphy, C. E., seconded by Dr. Benjamin Lee the nominations were closed. The chairman appointed Mr. Howard Murphy, C. E., as teller. The teller announced the result to be one blank, and five votes for Dr. Davis, and the chairman declared Dr. Davis duly elected. Dr. Davis, in taking the chair, briefly thanked the Board for the honor conferred.

New business.

Prohibiting the keeping of swine in Philadelphia.

New business being in order: The Secretary reported that the Philadelphia Board of Health had approved an ordinance prohibiting the keeping of swine within the city limits. It was feared that this would result in the creation of many piggery nuisances just outside the city limits, and the Secretary would suggest in anticipation of this, that the Board prohibit the keeping of swine

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within a certain (at present undefined limit). The sense of the Board was that it would be wiser to treat each individual nuisance as it arose.

Protection of forests bill.

The Secretary stated that the bill for the protection of forests, introduced in Congress by Senator Paddock had passed the Senate, and, on his motion, the Board instructed the Secretary to express its hearty sympathy with this movement, and to communicate the same to Senator Paddock.

Cholera in Europe.

The Secretary reported the prevalence of cholera in Europe, and asked the sense of the Board as to issuing a special circular, calling upon the people throughout the State to take the necessary precautions against this disease. He had already issued the usual circulars upon the subject. It was generally felt that such a circular would, at the present time, be premature. On motion, it was resolved that the Secretary take action on this subject when in his discretion it should become imperative.

Resignation of Dr. E. D. Payne, Medical Inspector and appointment of Dr. S. M. Woodburn.

In consequence of ill health, the Medical Inspector for the Lycoming district, Dr. E. D. Payne, of Towanda, had resigned. On the motion of the Secretary the resignation was accepted.

The Secretary proposed the names of Dr. E. T. Stevens, of Athens, and Dr. S. M. Woodburn, of Towanda, as proper persons to fill the vacancy. Mr. Howard Murphy, C. E., seconded the nomination of Dr. S. M. Woodburn. On motion of the same gentleman, seconded by Dr. J. F. Edwards the nomination was confirmed, and the President declared Dr. S. M. Woodburn duly appointed Medical Inspector for the Lycoming district.

Contemplated resignation of Dr. Spencer M. Free, Medical Inspector.

Dr. Spencer M. Free, Medical Inspector for the Western slope district had lately ceased to reside in the said district, and had felt compelled in consequence, to notify the Secretary of his early resignation.

Inspection of dams commission.

The recent calamities at Oil City, Titusville and Meadville, and the evident insecure condition of certain dams throughout the State, such as that at Pottsville had led the Secretary to suggest to His Excellency the Governor the importance of appointing a State Commission for the inspection of all dams in Pennsylvania. The replies of the Governor on the subject were now read. After some discussion, the following preamble and resolution were offered by Mr. Howard Murphy, C. E., seconded by Dr J. F. Edwards:

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WHEREAS, A communication from His Excellency the Governor concerning the inspection of dams has been presented by the Secretary; and

Whereas, It has been the special duty of this Board to become particularly familiar with the very serious insanitary conditions which have been created by the failure of dams, and the lack of provisions of adequate channels for the carriage of storm water in the cases of Johnstown, Oil City, Titusville and other localities; therefore,

Resolved, That the Board heartily approves of the proposed creation of a commission to inspect the dams and waste-ways of the State as a sanitary precaution, but as so many other than sanitary questions are involved, such as the loss of life and property, it would respectfully suggest to His Excellency the Governor that a recommendation to the Legislature to this effect emanate from him.

The resolution was adopted.

Presentation of accounts.

The Secretary presented accounts which had been audited and approved by the Executive Committee amounting to $393.75, and covering vouchers numbered 524 to 536. The accounts were on motion approved.

Copies of minutes to members.

On motion of Mr. Howard Murphy, C. E., seconded by Dr. George Groff, it was resolved that copies of the minutes be submitted to each member as provided, and that they be approved by the Board before being transcribed in the minute book.

Mover and seconder of minutes.

On the motion of Mr. Howard Murphy, C. E., seconded by Dr. J. F. Edwards, it was resolved that the names of the mover and seconder of each resolution be hereafter entered in the minutes.

Engineering inspections dividing line.

The subject of a dividing line between the Eastern and Western districts with regard to engineering inspections was, on the motion of Mr. Howard Murphy, C. E., seconded by Dr. Benjamin Lee, referred to a committee consisting of Mr. Howard Murphy, C. E., and Dr. J. H. McClelland, with power to act.

Closing of schools during epidemics.

With reference to the action of the Secretary in the closing of public schools during epidemics in the interval of meetings of the Board, it was resolved on the motion of Mr. Howard Murphy, C. E., seconded by Dr. J. F. Edwards, that a regulation conferring the necessary authority on the Secretary be drafted and submitted to the next regular meeting of the Board.

Regulation.

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The petition from certain citizens of Titusville requesting an inspection of the devastated region in that city, together with His Excellency's letter accompanying the same, and also requesting the Board to inspect the districts affected, together with the report of the city engineer of Titusville were read, and the accompanying plan examined. After careful consideration the opinion being expressed that it was outside the province of the Board to recommend the Legislature to make appropriations and expend the State moneys in the way asked by the petitioners; on the motion of Dr. Pemberton Dudley, seconded by Dr. J. F. Edwards, the Secretary was instructed to cause an inspection of Titusville to be made in reference to the sanitary condition of that city as affected by the recent flood, and to submit the report of such inspection at the next regular meeting.

Petition for an inspection of Titusville.

Resolved, That the information obtained by the Secretary in regard to pollution of streams, and laws of the several States on this subject, be embodied in the annual report in connection with the opinions of Alfred Lee, Esq., on this subject.

Pollution of streams.

In the matter of sending a delegate to the next meeting of the American Public Health Association at Mexico, on the motion of Mr. Howard Murphy, C. E., seconded by Dr. J. F. Edwards, it was

Delegate to meeting of American Public Health Association

Resolved, That the matter of sending a delegate to this meeting be deferred to a future meeting.

Dr. Benjamin Lee moved, Dr. Pemberton Dudley seconded, that the subject of the Birdsboro inspection be referred to the Committee on Water Supply, Drainage, Sewerage, Topography and Mines. It was carried.

Birdsboro inspection.

On the motion of Mr. Howard Murphy, C. E., seconded by Dr. J. F. Edwards, the matter of the drainage of the new House of Refuge was referred to the same committee.

House of Refuge drainage.

Dr. Groff moved, Dr. J. F. Edwards seconded, that the Secretary of the Board be authorized to communicate to the heads of all penal institutions in the State the resolution of Dr. Pemberton Dudley on the contagiousness of tuberculosis, and to accompany the same with the circular of the Board on consumption.

Circular letter on consumption to all penal institutions.

The proposed scheme of the Darby Creek Sewerage Company was now called up. The following preamble and resolution were offered by Mr. Howard Murphy, C. E., seconded by Dr. Benjamin Lee:

Proposed scheme for drainage of territory between Berwin and Bryn Mawr.

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WHEREAS, The territory between Berwyn and Bryn Mawr is absolutely in need of proper drainage;

And whereas, Unless some practicable scheme be adopted disastrous results may speedily ensue;

And whereas, No better means of securing thorough drainage can be adopted than to drain said territory by properly constructed and laid underground pipes connected with the Darby Creek:

Resolved, That we do approve and recommend the adoption and construction of a system of underground drainage of said territory with properly constructed and laid pipes into Darby Creek at a point not higher up stream than a point below the dam on the Levis estate near Garrettsville, provided that all solids be intercepted and cremated, or otherwise rendered innocuous, and provided that all other details of arrangement be such as to avoid the creation of nuisances prejudicial to the public health, and provided also that the sewer be so located that it can be readily extended to tide water if the protection of the public health demands it.

The preamble and resolution were adopted.

On motion of Mr. Howard Murphy, C. E., seconded by Dr. J. F. Edwards, it was

Right of eminent domain for sewerage companies.

Resolved, That the Committee on Sanitary Legislation, Rules and Regulations be instructed to prepare a bill to be presented to the next Legislature to confer on sewerage companies the right of eminent domain for carrying sewers through private properties.

Adjournment.

The Board then adjourned.

BENJAMIN LEE,
Secretary.

Special Meeting, August 13, 1892.

Special meeting.

A special meeting of the Board was held at the executive office at 2 p. m., Saturday, August 13, 1892.

Members present.

Present—Mr. Howard Murphy, C. E., Dr. George G. Groff, Dr. Pemberton Dudley and Dr. Benjamin Lee, Secretary.

In the unavoidable absence of the President, Dr. Samuel T. Davis, who was in a distant part of the country, Mr. Howard Murphy, C. E., was called to the chair on motion of Dr. Lee, seconded by Dr. Pemberton Dudley.

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The Secretary then presented accounts, vouchers numbered 537 to 541, amounting to $606.28, which had been audited and approved by the Executive Committee. On motion of Dr. Dudley, seconded by Dr. Groff, the bills were approved. Presentation of accounts.

On motion of Mr. Howard Murphy, C. E., seconded by Dr. Pemberton Dudley, the Board then adjourned.

BENJAMIN LEE,
Secretary.

Special Meeting, September 3, 1892.

A special meeting of the Board was held at the executive office, Philadelphia, on Saturday, September 3, 1892, at 2 p. m.

Present—Dr. Pemberton Dudley, Dr. J. F. Edwards, Dr. George G. Groff, Mr. Howard Murphy, C. E, and Dr. Benjamin Lee, Secretary.

In the unavoidable absence of Dr. Samuel T. Davis, President, who was in Idaho, Dr. Pemberton Dudley moved and Dr. Benjamin Lee seconded, that Mr. Howard Murphy, C. E., take the chair.

The motion was carried.

The Secretary read a communication from Dr. J. H. McClelland, stating that at the last moment he was prevented from attending.

The Secretary stated that the meeting had been called to hear his report as Secretary and Executive officer, of the measures already taken by him to aid in preventing the admission of Asiatic cholera into the United States, and to take such further measures as might be deemed necessary in view of the rapidly increasing gravity of the situation.

REPORT.

On the 21st day of May last, in anticipation of the arrival of cholera on our shores from Europe, Dr. Lee had sent copies of circular No. 7, revised, on "Precautions against cholera and other choleraic affections," to three hundred prominent daily papers throughout the State. He had taken this means of reaching both health authorities and the public generally, conceiving it to be the most effective, and had reason to believe the information thus conveyed was widely disseminated.

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On the 7th day of July he had visited the quarantine station of Boston, and on the 9th day of July that of New York, and conferred with the authorities of those stations as to the means to be adopted to place them in the highest state of efficiency.

Immediately on receiving intelligence of the prevalence of cholera in Hamburg, doubting the capacity of the station at lazaretto to care for any large number of suspects and patients, he had written to Dr. William H. Ford, President of the Board of Health of Philadelphia, and Major Moses Veale, health officers, advising that all vessels from European ports be detained at the United States Marine Hospital, Quarantine Station, Delaware Breakwater, for examination.

On the 26th of August he telegraphed Dr. Walter Wyman, Supervising Surgeon General of the United States Marine Hospital Service, as follows:

"The State Board of Heath of Pennsylvania considers that you would be justified in including arrivals from all European ports in your order of the 18th instant."

This action was taken in compliance with a request from the Secretary of the State Board of Health of Illinois. On the 29th of August a request was received from the same officer that the Board should co-operate with their own in memorializing the President to issue a proclamation suspending immigration until the cholera should subside. This he hesitated to do for two reasons: (1) because he doubted the legal power of the President to take this step; (2) because he felt that any such recommendation should take the regular course through the Marine Hospital Service, to which the duty of enforcing quarantine is assigned by law.

The following telegram was therefore sent:

"Dr. WALTER WYMAN, *Supervising Surgeon General of the United States Marine Hospital Service, Washington, D. C.:*

"In view of the cholera situation the State Board of Health of Pennsylvania respectfully suggests that absolute prohibition of immigration from Europe during the present epidemic be enforced. If your department does not possess the power this Board will second you in petitioning the President to do so, and if necessary to call Congress in extra session to authorize such action.

BENJAMIN LEE,
Secretary."

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To this the following reply was received:

"WASHINGTON, D. C., *September 1, 1892.*

"Dr. BENJAMIN LEE, *Secretary of State Board of Health of Pennsylvania:*

"Circular issued to-day. Have State Board of Health to declare twenty days' quarantine on all immigrant vessels. See circular in press dispatches.

"(Signed) WYMAN,
"*Surgeon General.*"

The Secretary had recently had a personal interview with the Secretary of the State Board of Health of New York, who had issued stringent instructions to city and township health officers on the northern border of that State to use the utmost vigilance in preventing the disease from entering the country from Canada should it unfortunately obtain a foothold in that country. He had promised to keep the Pennsylvania State Board of Health informed of all suspicious cases that may occur, and of all action taken by him.

A special circular—"To all Health Officers, Boards of Health and Borough Councils in the Commonwealth of Pennsylvania"—was now in the hands of the State Printer, having been sent to him on the 24th of August, with order to print 10,000. This circular advised all these authorities, in the strongest possible terms, to supplement their vigilance by placing their towns in such a condition of cleanliness that should a few stray cases of cholera pass the coast cordons its germs would find no congenial nests in which to develop. It further advised the passing of stringent regulations or ordinances in regard to cesspools, drains, pig-styes, slaughter houses, gutters and other similar nuisances, especially urging that all public supplies of drinking water should be carefully investigated. With this circular it was proposed to issue copies of No. 7 cholera circular and the model ordinance and sanitary survey blanks.

Respectfully submitted.

BENJAMIN LEE,
Secretary.

On motion of Dr. Groff, seconded by Dr. Dudley, it was resolved that the action of the Secretary with reference to the exclusion of cholera be and is hereby heartily approved and endorsed.

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On motion of the same gentleman it was resolved, that pending the arrival of the special circular from the State Printer, a few copies of this regulation be sent to the principal newspapers throughout the State.

The Secretary then submitted the following order:

"In accordance with the proclamation of the President of the United States, and in compliance with the request of the Surgeon-General of the United States Marine Hospital Service in charge of the National System of Quarantine, the State Board of Health of Pennsylvania hereby orders that in view of the fact that Asiatic cholera prevails in many ports and states of Europe, including Great Britain, no vessel from any cholera-infected port shall be permitted to enter at any port in this State until such vessel shall have undergone a quarantine detention of twenty days.

"It is further ordered that no vessel as hereinbefore described shall be permitted to enter the waters of the Delaware river above the line dividing the State of Pennsylvania from the State of Delaware, without having been previously inspected by the officer in charge of the United States Marine Hospital Station near the town of Lewes, in the State of Delaware, it being understood that such order is co-operative with, and not in contravention of the orders of the Board of Health of the city of Philadelphia.

"It is further ordered that no boat, tug, skiff or any other conveyance shall be permitted to land on the shores of any river or lake, or at any wharf or dock on the same from any such vessel, or to go from said shores to any such vessel, save and except those which are employed or authorized by legally constituted quarantine authorities.

"All police officers and constables in townships bordering on waters into which such vessels may come are hereby enjoined to keep vigilant watch to prevent any such intercommunication."

This order shall take effect at once.

By order of the Board.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.

The order having been read, Dr. George G. Groff moved, and Dr. J. F. Edwards seconded, that the order as read by the Secretary be adopted and approved.

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The motion was carried.

On motion of the same gentleman, the Secretary was instructed to have copies of this regulation printed and sent to every member of the Board, and that the order, together with all the proceedings of this meeting, be given for publication to the press.

The Secretary then read a copy of a regulation of transportation companies, as follows:

TO TRANSPORTATION COMPANIES.

In accordance with regulation III of this Board, which reads as follows:

Regulation in regard to the sanitary supervision of travel and traffic.

Upon satisfactory information of the approach to, or the transit through, the Commonwealth of Pennsylvania of infected persons or goods, it shall be the duty of the Secretary, as executive officer of the Board, to cause the same to be stopped at the State line, or, if found within the limits of the State, to cause such persons or goods to be removed from cars, stages, vessels, boats, or other conveyances, and securely isolated and disinfected; and he may, if in his judgment the emergency is such as to demand it, call a meeting of the Committee on Travel and Traffic, to which his action shall be submitted, with his reasons therefor, in writing. But, in cases coming under the jurisdiction of national or municipal quarantine authorities, he shall co-operate with said authorities in all such action.

Notice is hereby given to the officers of all transportation companies, whether by land or by water, that any transportation company shall be declared contraband of quarantine which shall introduce, land or transport within the borders of this Commonwealth of Pennsylvania any person suffering from Asiatic cholera or cholerine (so-called), or any person who shall develop said disease within four full days after having been so introduced, transported or landed within the borders of said Commonwealth by such company.

If a railroad company be thus declared contraband of quarantine its trains shall be stopped at the State line, and held until inspected by an inspector of this Board and declared by him free from the danger of conveying the contagion of Asiatic cholera into this Commonwealth.

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If a steamboat, canal, or other navigation company, its boats shall not be allowed to enter any dock, tie up at any wharf, or by any means land passengers, baggage or merchandise until it has undergone like inspection and been declared free from danger of introducing the said contagion into the Commonwealth of Pennsylvania.

By order of the Board.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.

On motion of Dr. George G. Groff, seconded by Dr. J. F. Edwards, the regulation as read was adopted and approved.

The Secretary then submitted the following circular of instructions:

To the Officers of Railroad and Steamboat Companies in Pennsylvania, etc.:

The principal railroad companies operating in this State have adopted admirable regulations for the sanitary care of their cars and premises under ordinary condition. The State Board of Health has already taken occasion to commend these, as well as the readiness of these companies to co-operate with it in efforts to protect the public health. In view, however, of the threatened invasion of Asiatic cholera, it is important to enforce these regulations with unusual strictness, and to take certain additional precautions.

The Board therefore orders:

First. That all water-closets and urinals in cars be provided with proper water-tight receptacles for retaining deposits instead of allowing them to fall on the tracks and thus endanger water supplies, said receptacles to contain disinfectants, and to be renewed at certain intervals in such places and in such a manner as may be determined upon for the most perfect protection against infection. The adoption of the precaution should be begun with second-class and immigrant cars, and extended as rapidly as possible to first-class cars.

Second. Should the discharges of the sick fall upon seats, floors or platforms of cars or stations, they should be first disinfected, and then removed in closed buckets, and the soiled places then disinfected and thoroughly cleaned.

Third. All cars coming from infected places shall be disinfected before sweeping, and the sweepings disinfected and burned.

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Fourth. All water-closets and urinals in steamboats and canal boats shall be provided with proper water-tight receptacles for retaining deposits instead of allowing them to fall into the water, which is in most instances the supply of drinking water for some center of population. Such receptacles shall always contain disinfectants, and shall be emptied at the end of each trip in such manner and in such place as may be designated by the local authorities.

Fifth. All accumulations of filthy clothing and rags shall be at once disinfected and burned.

Sixth. Should cholera become epidemic the drinking water furnished for the use of passengers should be boiled, and so far as possible should not be obtained from places in which the disease exists.

By order of the Board.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.

On motion of Dr. George G. Groff, seconded by Dr. J. F. Edwards, the order as read was adopted and approved.

Dr. P. Dudley moved, and Dr. Benjamin Lee seconded, That the Medical Inspectors of the State Board of Health be instructed to note, as opportunity offers, what action is being taken by municipal authorities and railroad and steamboat companies, in conformity with the orders and instructions of the Board, and to report the same to the Secretary.

The motion was carried.

On motion of Dr. P. Dudley, seconded by Dr. Benjamin Lee, it was

Resolved, That the attention of the National government be drawn to the fact that a deliberate plan has been formed for the introduction into the United States, through Canada, of immigrants now under the ban of the President's proclamation.

Dr. George G. Groff moved, and Dr. J. F. Edwards seconded, that the Secretary be instructed to appoint deputy medical inspectors at such points as circumstances may, in his judgment, render necessary.

The motion was carried.

Dr. Benjamin Lee moved, and Dr. J. F. Edwards seconded, and it was

Resolved, That the Secretary be instructed to represent to His Excellency the Governor of the State, the danger now threatening our population from cholera,

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the inability of the Board to appoint paid agents who may be necessary for purposes of railroad inspection and other precautionary measures, and to inquire of him whether any portion of the moneys in the State treasury can be drawn upon to meet these exigencies.

Dr. George G. Groff moved, and Dr. J. F. Edwards seconded, that the Secretary be instructed, on the appearance of cholera in any portion of the State, without sanitary authorities, to confer with the county authorities in regard to the furnishing of hospital accommodation and medical and nursing care, and to make application to the Adjutant General of the State for a sufficient number of tents for hospital purposes.

The motion was carried.

The same gentleman moved that the Board advises that all drivers and attendants of ambulances, and all other persons coming in contact with cholera patients, and are compelled to pass through the public streets, should wear oil cloth or rubber coats and overalls.

The motion was carried.

On motion of Dr. George G. Groff, seconded by Dr. Benjamin Lee, it was

Resolved, That the United States authorities be requested to provide accommodation on shore for all passengers and crews whose vessels are detained in quarantine at the Delaware Breakwater.

The Board then adjourned.

(Signed) BENJAMIN LEE,
Secretary.

Special Meeting, September 16, 1892.

A special meeting of the Board was held at the executive office, Philadelphia, on Friday, September 16, 1892, at 2.15 p. m. Present, Howard Murphy, C. E., Pemberton Dudley, M. D., J. F. Edwards, M. D., and Benjamin Lee, M. D., Secretary.

In the absence of the President, Mr. Howard Murphy, C. E., was on motion called to the chair.

PRECAUTIONS IN REGARD TO TRANSPORTATION OF CHOLERA.

The Secretary stated that this meeting was held at the call of Dr. Pemberton Dudley and Dr. J. F. Edwards, and the Secretary in view of a contemplated conference of the Committee on Preventable Diseases, Disinfection, and Sanitary Supervision of Travel and Traffic with the man-

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agers of the principal railroad companies operating in Pennsylvania, to consider the most practical and efficient means for carrying out the instructions of the Board with regard to preventing the transportation of cholera into the State.

POINTS OF ENTRY OF RAILROADS.

The Secretary read a list of all points of entry of railroads carrying passengers into Pennsylvania. He further pointed out the most important of these points of entry at which roads carrying immigrants enter the State, and suggested that the necessity might arise for examining passengers on trains at all such dangerous points.

REPORT OF CONFERENCE AT PITTSBURG.

He reported that at a Conference recently held at Pittsburg between himself, the Secretaries of the State Boards of Health of Ohio and West Virginia, and the mayor and other prominent officials of Pittsburg, a resolution had been passed that the Governor of this State be requested to at once raise the sum of $50,000 to be placed at the disposal of the State Board of Health to meet the existing emergency. He pointed out that the proposed Medical Inspector at such points of entry would require prompt payment, and that numerous other expenses would be incurred, which indicated the necessity for the Board being provided with funds without unnecessary delay. He suggested that Dr. J. F. Edwards, Chairman of the Committee on Preventable Diseases, Disinfection and Sanitary Supervision of Travel and Traffic was the appropriate member of the Board to assume general supervision of this whole matter of inspection of passengers.

RESOLUTION TO CALL A PUBLIC MEETING OF CITIZENS.

Dr. J. F. Edwards moved, and Dr. Pemberton Dudley seconded, that the Board respectfully request his honor the mayor of Philadelphia to call a meeting of leading citizens for consultation with the State Board of Health in order to devise means for raising funds to meet the emergency which now confronts the Board in view of the threatening invasion of cholera, and to enable said Board to repel the same.

The motion was carried.

The Board then took a recess to enable the Committee on Preventable Diseases, Disinfection and Sanitary Su-

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pervision of Travel and Traffic to hold its proposed conference with the officers of railroad companies.

Subsequently to the conference the Board reconvened.

The Secretary pointed out that the result of the conference just concluded showed the magnitude of the work before the Board.

On motion of Dr. Pemberton Dudley, seconded by Dr. J. F. Edwards, it was

Resolved, That the question of the time of the public meeting with his Honor the Mayor be left in the hands of the Secretary. On motion of Dr. J. F. Edwards, seconded by Dr. Pemberton Dudley, the Board then adjourned to meet at the call of the Secretary.

(Signed) BENJAMIN LEE,
Secretary.

Special Meeting, September 21, 1892.

A special meeting of the Board was held at the Colonnade Hotel, Philadelphia, on Wednesday, September 21, 1892, at 2.15 p. m.

Present—Hon. Samuel T. Davis, M. D., President in the chair. Mr. Howard Murphy, C. E., Pemberton Dudley, M. D., J. F. Edwards, M. D., and Benjamin Lee, M. D., Secretary.

A telegram was read by the Secretary from Dr. James H. McClelland, of Pittsburg, regretting that he was unable to be present. A letter to the same effect was also read from Dr. George G. Groff, of Lewisburg.

On motion of Mr. Howard Murphy, C. E., seconded by Pemberton Dudley, M. D., it was

Resolved, That the Secretary be instructed to telegraph to the Governor, asking at what time it will be convenient for him to meet the Board, as a result of a conference with the Citizens' Relief Committee of Philadelphia.

On motion of Mr. Howard Murphy, C. E., seconded by Pemberton Dudley, M. D., it was further

Resolved, That the Committee on Water Supply, Drainage, Sewerage, Topography and Mines be authorized to arrange for a conference between the health and municipal authorities of all towns within the drainage area of the river Schuylkill and this Board at as early a date as possible.

(Signed) BENJAMIN LEE,
Secretary.

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Special Meeting, September 22, 1892.

A special meeting of the Board was held at the Lafayette Hotel, Philadelphia, September 22, 1892, at 3.30 p. m.

Present—Hon. Samuel T. Davis, M. D., in the chair, Dr. Pemberton Dudley, Dr. J. F. Edwards, Mr. Howard Murphy, C. E., and Dr. Benjamin Lee, Secretary.

The Secretary stated that this was a special meeting of the Board, called in pursuance of the resolution passed at the meeting held the previous day (September 21, 1892), requesting His Excellency the Governor of the State to appoint a time and place at which the Board could meet him in conference regarding the question of providing funds to meet the emergency created by the presence of cholera in a neighboring city. Such conference having taken place, it was for the Board to decide what action should be taken.

The Secretary read a telegram from Dr. J. H. McClelland, asking for instructions as to the money offered to the Board.

NO LAW TO ACCEPT ADVANCES OF MONEY.

On motion of Dr. Pemberton Dudley, seconded by Dr. J. F. Edwards, it was

Resolved, That the Secretary be instructed to reply to the generous offer of the Carnegie Steel Company to advance the sum of $20,000, to aid the Board in taking measures to prevent the introduction of cholera into this State, that the Board finds itself without authority under the law to accept any advances of money, except through the Executive of the State.

On motion of Mr. Howard Murphy, C. E., seconded by Dr. Pemberton Dudley, it was

Resolved, That the Secretary be instructed to ask the different railroad companies throughout the State, to whom circulars were sent, to disinfect their cars and carefully inspect their lines, cars and stations, for a detailed report as to whether these instructions have been complied with.

Mr. Howard Murphy, C. E., moved, and Dr. J. F. Edwards seconded,

Whereas, The Board considers the danger of an epidemic of Asiatic Cholera in the State of Pennsylvania next year imminent, and that immediate measures should be taken to prepare for the protection of the people by arranging for proper sanitary supervision of travel and

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traffic, patrol of the State, and examination of the drainage systems and water supplies of the Commonwealth.

Resolved, That His Excellency the Governor of the Commonwealth be respectfully requested to place $50,000 at the present disposal of the Board.

Mr. Howard Murphy, C. E., voted in the affirmative, Dr. Samuel T. Davis, and Dr. Benjamin Lee in the negative, Dr. J. F. Edwards not voting.

The resolution therefore failed to pass.

The Board then adjourned.

(Signed) BENJAMIN LEE,
Secretary.

Twenty-third Regular Meeting.

Twenty-third regular meeting.

The twenty-third regular meeting of the Board was held at the Supreme Court room, Harrisburg, November 10, 1892, at 4.15 p. m.

Members present.

Present—Hon. Samuel T. Davis, M. D., president, in the chair. Pemberton Dudley, M. D., George G. Groff, M. D., Mr. Howard Murphy, C. E., and Benjamin Lee, M. D.

The Secretary read a letter from Dr. J. F. Edwards regretting that in consequence of a death in his immediate family he would be unable to attend the meeting; also a telegram from Dr. J. H. McClelland announcing his inability to be present.

Order of business.

An order of business presented by the Secretary was adopted as the order of the day.

Minutes presented.

The minutes of the last regular meeting held at Harrisburg, July 11, 1892, and of special meetings held at Philadelphia August 13, September 3, September 16, September 21 and September 22, 1892, were presented.

On suggestion of Dr. Pemberton Dudley it was ordered that the order of the President of the United States of September 17, 1892, with regard to the disinfection of the baggage of immigrants, be inserted in the minutes of September 3, 1892, at the point where reference to it had been made.

Minutes approved.

On motion of Dr. Pemberton Dudley, seconded by Dr. George G. Groff, the minutes of all the meetings were now approved.

Report of Secretary approved.

1. The report of the Secretary being in order, as its first item the Secretary read his eighth annual report.

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Dr. George G. Groff moved, Dr. Pemberton Dudley seconded, that the report of the Secretary be accepted and approved with the thanks of the Board, and that, in conjunction with the minutes of the Board for the past year, the same be forwarded to His Excellency the Governor as the annual report of the Board. The motion was carried.

During the reading of the annual report action on certain of the suggestions and topics therein contained was deferred to new business.

2. In accordance with a resolution passed at the last meeting of the Board the Secretary had drafted the following regulation regarding the control of epidemics:

REGULATION VIII.

Regulation for the control of epidemics.

Whenever the Secretary shall have satisfactory information that any of the following diseases, viz: Smallpox, varioloid, scarlet fever, diphtheria, yellow fever, typhus fever or Asiatic cholera is epidemic or threatens to become epidemic in any city, borough, district or place having no local board of health, or in which the sanitary laws or regulations are inoperative, he shall have authority, as executive officer of the Board, to issue a proclamation in the name of the Board, declaring such disease epidemic, and to order and enforce such measures in the way of quarantine, isolation of the sick, vaccination, disinfection, and the closure of schools, public and private, religious and secular, as in his judgment may be necessary to stamp out the infection.

The regulation was ordered to be brought up under new business.

Inspection of dams.

3. In accordance with the instructions of the Board the resolution respecting the State inspection of dams had been transmitted to the Governor.

Report on purity of water supplies.

4. The Secretary presented a printed report on the "Responsibility of the National and State Governments for the Protection of the Purity of Water Supplies," being the substance of an address delivered by him as chairman of the section on State medicine of the American Medical Association at its recent meeting.

Invitation to American public health association in Mexico.

5. The Secretary referred to the subject of responding to the invitation of the American Public Health Association to send a delegate to attend their meeting in the city of Mexico on the 29th inst. Arrangements had been concluded for a greatly reduced rate by the railroad com-

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panies. On motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, it was resolved that the Secretary be named as a delegate to attend the meeting.

Secretary for delegate.

Inspection of new house of refuge

6. Accompanied by Mr. Howard Murphy, C. E., Chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, the Secretary had visited and made a careful inspection of the drainage of the new House of Refuge. As Mr. Murphy was present and was more familiar with the details of the system than himself, the Secretary, seconded by Dr. Pemberton Dudley, moved that consideration of this matter be deferred until Mr. Murphy's report was reached.

Consumption in penal institutions.

7. Acting under instructions from the Board, the Secretary had transmitted copies of the circular on consumption to the superintendents of sixty-seven penal institutions throughout the State, with a letter calling their attention to the necessity for adopting certain precautions to prevent their institutions from becoming infected with the germs of the disease, and asking for statistics of its prevalence among their inmates. Replies received up to the present time indicate that it is a rare thing for a case of consumption to be found in the smaller county jails. The State penitentiaries had not yet been heard from.

Sanitary legislation

8. With regard to sanitary legislation, the needs of the State continue as they have ever been since the establishment of the Board, and as the Board has pressed them upon the attention of each successive Legislature.

First. The sanitary organization of the State throughout the rural districts, so that every portion of the State may have some legally constituted local health authority.

Secondly. The compulsory establishment of Boards of Health in all cities.

Thirdly. The authorization and establishment of Boards of Health in all incorporated boroughs.

Fourthly. Protection of the purity of water supplies.

Fifthly. The establishment of an emergency fund, adequate to meet ordinary emergencies.

Sixthly. An increased appropriation for the ordinary work of the Board.

Seventhly. An act to confer upon sewerage companies the right of eminent domain through private properties.

Protection of forests.

9. A resolution of thanks had been sent to Senator Paddock for introducting a bill into Congress for the protection of forests.

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10. A complaint had been received of the impurity of the water supply of Birdsboro, Berks county, with a request that the Board inspect the reservoir and sources of supply. Mr. W. H. Boardman, C. E., Engineer Inspector was ordered to make an inspection. He reported the supply as being obtained from several small streams impounded in a large reservoir formed by an earthen dam built across a ravine. The dam was excellently located and well designed, the reservoir affording an abundant supply of water by gravitation. The nuisance was caused by a large number of old stumps, and débris in the bottom of the reservoir, by the building of a brick wall laid in cement mortar across the spillway (which forced the water out of its original limits back into the woods), and the absence of a fence around the reservoir to prevent contamination by cattle.

Impure water at Birdsboro.

He recommended the removal of the brick wall and all all other obstacles in the spillway, the clearing away of all stumps, débris, etc., and the building of a fence entirely around the reservoir, with other minor suggestions. These recommendations were forwarded by the Secretary to the local authorities.

11. Dr. L. H. Taylor, Medical Inspector of the Wyoming district had recently visited Europe. He had named Dr. Walter S. Stewart as Inspector *pro tem.* during his absence, which the Secretary had approved. On motion of Dr. P. Dudley, seconded by Dr. George G. Groff, the nomination of Dr. W. S. Stewart as above stated was confirmed.

Nomination of inspector fo r Wyoming district.

12. A report being received by the Secretary that some members of an Italian colony at Mill Creek, Wyoming county, were preparing to disinter the remains of one of their people who had died a few days previously from small-pox, the Secretary telegraphed the poor directors of that county as follows: "The State Board of Health forbids the body of John Rock to be disintered. Arrest any one attempting it."

Attempted disinterment of body dead of small-pox.

13. Dr. E. C. Town, Special Inspector Pennsylvania Railroad Company, had reported on four occasions the destruction of filthy and suspected clothing and packages left on the company's property, numbering in all, 678.

Report of Special Inspector Dr. E. C. Town.

The Secretary had approved his action, and also authorized him to destroy any trunks or boxes found to contain filthy clothing and effects.

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Small-pox at Bunola.

14. An outbreak of small-pox at Bunola, Allegheny county, was reported by Dr. Charles H. Shaffer, of Elizabeth on August 3. Dr. J. H. Thompson had been instructed to investigate.

He reported one case of confluent small-pox. He had made arrangements for quarantining the patient, vaccination of all the other inmates of the house, and had ordered stores burned and house fumigated. Notwithstanding these precautions three other cases of the disease had developed. At a later period it was reported that gross carelessness was being shown by the county poor directors who had assumed control of the cases, in allowing clothing to be used which had been exposed to the contagion, and the Secretary had addressed an energetic remonstrance to the authorities on the danger of such a procedure.

Appointment of deputy inspectors, for Lansdowne.

15. In July last the Secretary had been requested by Dr. James E. Garretson, to appoint a Sanitary Advisory Committee to have charge of the public hygiene of the town and vicinity of Lansdowne, Delaware county. The request had been acceded to by appointing Dr. Garretson, Dr. J. Gibbons Hunt and Dr. A. L. Pennock, deputy inspectors for the sub-district of Lansdowne. On motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, these appointments were confirmed.

Diphtheria at Kirkwood.

16. An epidemic of diphtheria had prevailed at Kirkwood and vicinity, Lancaster county, during the past summer. A stringent order, a copy of which was presented, had been prepared by the Secretary and sent to Dr. T. J. Wentz of that place for distribution.

Diphtheria at Chadd's Ford.

17. An epidemic of diphtheria had also prevailed at Chadd's Ford, Delaware county. An inspection by Dr. W. B. Atkinson had revealed the fact that the disease had originated in a house which had a defective drain. The drainage from an hotel was also strongly suspected of causing the water supply of the place to be polluted. Orders were sent for the abatement of these nuisances and a deputy inspector was appointed.

Small-pox at Pittsburg.

18 An outbreak of small-pox had been reported at Pittsburgh, on July 26th, by Mr. W. F. McKelvy, chief clerk Bureau of Health. There were two cases, both Italians, one of whom left before complete recovery to work in a quarry at Dunbar, Pennsylvania. The Secretary had promptly notified the authorities of that place to be on guard. Another outbreak resulting in four cases had occurred in the same city during the latter part of Sep-

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tember. The patients had been promptly removed to the hospital for infectious diseases, and every precaution had been taken to prevent the spread of the disease.

Dysentery at State Lunatic Hospital

19. An outbreak of dysentery had occurred at the State Lunatic Hospital at Norristown, Montgomery county. In his report, Medical Inspector W. B. Atkinson, who had investigated, stated there had been seventy cases of all grades of severity both among the patients and attendants, thirteen of the former had died, eight females and five males. The whole condition of the hospital was found to be excellent. In every fatal case the condition of the patient was such that death must inevitably have occurred in a short time, most of them being afflicted with paresis or Bright's disease. He further reported the drainage to be still under inspection and not in the best possible condition, and from all sources of information he was led to the conclusion that the prevalence of the disease was but a milder continuance of that which prevailed last year to a much greater extent.

Mr. Howard Murphy, C. E., moved, and Dr. George G. Groff seconded, that the report of Dr. W. B. Atkinson of his investigation into the causes of dysentery at the State Lunatic Hospital, Norristown, be not printed in the annual report of the Board. Mr. Howard Murphy, C. E., Dr. George G. Groff and Dr. Pemberton Dudley, voted in the affirmative, Dr. Benjamin Lee voted in the negative, Dr. Samuel T. Davis not voting. The motion therefore was carried.

Defective drainage at Norwood.

20. A complaint had been received of defective drainage at Norwood, Delaware county, and an inspection was ordered by the Secretary. Medical Inspector W. B. Atkinson reported that the drainage of the two houses flowed into a channel of a road, and there being no outlet the sewage stagnated in front of the complainant's door. The Secretary ordered that other means be found for the disposal of the sewage.

Complaint of slaughter house at Muncy.

21. A complaint of the insanitary condition of a slaughter house at Muncy, Lycoming county, had been received, and Dr. George G. Groff had been requested to make an inspection. He reported being unable to find any serious cause for complaint. He recommended that the slaughter house and yard be moved back from a run on which they were located. None of the complainants could be found.

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Complaint of Local Board of Health of Norristown.

22. The local Board of Health of Norristown, Montgomery county, had petitioned the Board with regard to the abatement of certain nuisances in that borough. Dr. W. B. Atkinson had made an inspection and verified the complaints as to the insanitary condition of the county bridge, the fish market and a bone boiling establishment. The Secretary had addressed a communication to the borough council in regard to the fish market, and an order to abate the nuisance on the county bridge had been served on the county commissioners. The Board having no jurisdiction in the matter of ordering the removal of the bone boiling establishment, no action had been taken in regard to it.

Diphtheria at Trainer.

23. An epidemic of diphtheria had prevailed at Trainer, Delaware county, for several weeks. Medical Inspector Atkinson had made an investigation with regard to the sanitary condition of the village twice, but had been unable to find any direct cause for the disease. Several nuisances were found and notices had been served for abatement, but these nuisances were not thought to be responsible for the epidemic.

Action of U. S. M. H. S. as to disinfection of baggage.

24. Reference was again made to the action of the United States Marine Hospital Service in accordance with the order of the President of the United States with regard to the disinfection of the baggage and personal effects of all immigrants from European ports.

Resolutions with regard to importation of rags with reference to cholera.

25. The Secretary submitted copies of the resolutions passed by the Philadelphia Board in regard to the importation of rags, with special reference to Asiatic cholera, as follows:

Resolved, By the Board of Health of the city and port of Philadelphia, that hereafter no rags from foreign ports shall be permitted to land at the port of Philadelphia until they shall have been disinfected to the entire satisfaction of the Board, either at this port or at the port from whence shipped.

Resolved, That rags collected in or brought from places where dangerous, contagious or infectious disease prevails shall be deemed suspicious and be liable to be excluded from this port. That rags brought from other places must be accompanied with reliable evidence that they have been collected in places (naming the places) where no contagious or pestilential disease (such as cholera, small-pox, etc)., prevails.

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26. In accordance with the instructions of the Board with reference to the preparation of quarters for the detention of immigrants suspected of being liable to import Asiatic cholera at the Delaware Breakwater, the following telegram was at once sent by the Secretary to Dr. Walter Wyman, Supervising General of the United States Marine Hospital Service at Washington:

Quarantine of cholera suspects at Delaware Breakwater.

"'The State Board of Health of Pennsylvania earnestly urges that your department provide accommodations on shore for passengers and crews of vessels detained by the quarantine of the Delaware Breakwater at the earliest possible moment, and if necessary that the Government purchase an additional site for the purpose.

27. The Secretary read a copy of the Report of the Quarantine Commission of the National Conference of State Boards of Health on the defenses against cholera along the Delaware basin.

Report of Quarantine Commission.

The Secretary was glad to be able to state that the Commission had expressed an extremely favorable opinion of the preparations made by the Philadelphia Board of Health for the reception of the cholera infected ships.

28. A copy of the instructions to Deputy Inspectors who had been appointed with regard to the threatened invasion of cholera was read.

Instructions to Deputy Inspectors.

29. A copy of the circular on railroad inspection and disinfection with regard to cholera was also read.

Railroad Inspection

30. A request had been received from the mayor of Allegheny City for an inspection of the water supply of that city, and a personal inspection was made by the Secretary on September 11. This investigation revealed the fact that the water of the city was being dangerously polluted by sewage from a population of about seventy-five thousand persons in the city of Pittsburg in addition to the drainage from a large hospital and several small boroughs situated farther up the stream. He recommended the removal of the inlet pipe to a point above the city, which would avoid the introduction of this great flood of filth, and addressed a written communication strongly urging immediate action to his Honor, W. M. Kennedy, mayor.

Inspection of water supply of Allegheny City.

31. At the request of the Secretary of the State Board of Health of Ohio, the Secretary met that officer and the Secretary of the West Virginia Board at Pittsburg on Sunday, September 11, to consider the best means for preventing the spread of the disease through the medium

Conference of Secretaries of adjacent States with regard to cholera.

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of the railroads. As the mayor of that city had been in correspondence with the Secretary on the same subject, he invited him and such prominent officials as he might approve to be present. The whole subject was thoroughly discussed, and it was decided that the readiest means of meeting the danger, and at the same time avoiding interference with travel, was the placing of medical inspectors on trains, the furnishing of each immigrant or other suspected passenger with a certificate by the inspection officer at the port of entry, and the viseing of such certificates by the State Medical Inspector on crossing the State Line.

Before the close of the meeting a resolution was passed requesting the Governor of Pennsylvania to place the sum of fifty thousand dollars at the disposal of the State Board of Health to meet the existing emergency.

Immigrants returned to Sharon from Ohio.

32. On the 22d of September a telegram was received by the Secretary from Sharon, Mercer county, stating that the State of Ohio was quarantining against immigrants entering Ohio at that point; two cars containing ten immigrants had been returned to that town. The Secretary at once wired as follows:

"Railroad company responsible for support of persons detained. Have ordered Inspector Woods to take charge."

A telegram was also sent to Dr. A. A. Woods, instructing him to visit Sharon and arrange for quarantine. Dr. Woods shortly afterwards reported that these persons were passed on the next morning, the reason of their detention being that they were not provided with certificates from the quarantine authorities. Several of them had been in the country two or three months.

Inspection of immigrants entering Pennsylvania by B. & O. R. R.

33. In response to the repeated requests of the mayor of Pittsburg, Dr. J. S. Hackney, Medical Inspector for the Southern tier district, was sent to Cumberland, Maryland, to inspect the immigrants entering Pennsylvania by the Baltimore and Ohio railroad. The approval of the railroad company and the consent of the State Board of Health of Maryland were obtained for this purpose. The report of the inspector was read.

List of immigrants to New York and Philadelphia from cholera infected ports.

34. The Secretary presented a list of the steamships which had arrived at the ports of New York and Philadelphia bringing immigrants, on board of which were cases of contagious disease or which had sailed from cholera infected ports. The burgesses and health officers

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of the several places for which these immigrants were destined were notified of their arrival and highly appreciated this information.

35. A complaint had been received of defective drainage at Johnstown, Elk county. Medical Inspector Spencer M. Free had investigated the matter. He reported that the nuisance was caused by the railroad company refusing to allow the sewer from a hotel, the buildings of a real estate company and of a manufacturing company to pass under the tracks. The company was willing, however, to grant this permission to the borough authority. The Secretary had addressed a communication to the borough authorities urging the immediate construction of a proper sewer.

Inspection of drainage at Johnstown.

36. Application had been made to the Board for an inspection of Lansdowne, Delaware county, with reference to a proposed plan of sewerage.

Report of inspection of proposed plan of sewerage at Lansdowne.

Mr. W. H. Boardman, C. E., Engineer Inspector for the Eastern district, was directed to make an inspection. His report, which was now read, stated that the only mode of disposing of the sewage at present was by means of an open ditch passing through the town and emptying into Darby creek. This open sewer he characterized as an abominable nuisance. A plan proposed by several influential residents to abate this nuisance was under consideration, viz: by laying about ten thousand feet of eight, six and five inch sewer pipe to a receiving well to be located on Darby creek.

The Inspector had been advised that a company had been formed to build a large intercepting sewer along Darby creek, from Berwyn to a point above Clifton. This proposed sewer would pass somewhere in the neighborhood of the proposed Lansdowne disposal field. He recommended that the Board approve of a properly designed sewerage system through Lansdowne and vicinity to discharge into Darby creek, provided the best obtainable temporary means be adopted to purify the sewage before discharge; and, provided that the whole system be so designed and located as to form part of a comprehensive sewerage system for the entire Darby creek valley, and provided that nothing be done or maintained which shall be prejudicial to the public health. Mr. Howard Murphy, C. E., moved, and Dr. George G. Groff seconded, that the report of the engineer inspector be accepted and the sug-

Approval of Board.

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gestions made therein approved by the Board. The motion was carried.

Small-pox at New Castle, Pa.

37. On the 19th of September a telegram was received from C. O. Probst, of Columbus, Ohio, asking if the Board had any information of the existence of small-pox at New Castle, Lawrence county, Pennsylvania. In response to a telegram the mayor of that city reported that there had been four cases of the disease, one of which had proved fatal. The first case, that of a young woman (the origin of which could not be traced), was diagnosed as chicken-pox. Hence many persons had been exposed. The cases were being quarantined by policemen, and every precaution taken to prevent the disease from becoming epidemic. Dr. J. R. Thompson was directed to make an inspection and report. After investigation he reported that every precaution was being taken as regards isolation of the patients, vaccination and disinfection.

As a result of the mistaken diagnosis fifteen cases developed, one of them being in the person of Dr. Bell, deputed by the borough council to attend the cases. The epidemic had now been brought under control.

Small-pox at McKeesport.

38. Two cases of small-pox had also occurred at McKeesport, Allegheny county, of which the Secretary had been notified by Mr. A. C. Wallace, secretary of the Board of Health. The cases were promptly isolated, and stringent precautions taken. Dr. J. R. Thompson who made an inspection, reported with reference to the first case, that the patient had sat near to a sick lady on a train and this was supposed to be the cause of the two cases. Everything necessary was being done to stamp out the disease.

Cholera proclamation.

39. The Secretary presented a proclamation with regard to cholera, which had been issued by the burgess of Huntingdon, and which he commended for its promptness and vigor.

Insanitary condition of Italian settlement at Wayne.

40. Complaints had been received of the insanitary condition of an Italian settlement at Wayne, Delaware county, and Dr. W. B. Atkinson was instructed to make an inspection. He reported the settlement as being a collection of fifty huts, which served as shelter for two squads of men, mostly employed in a quarry contiguous thereto. On one side were two closets set apart for nearly 100 men and on the other one closet for about fifty men. The ground showed that it was used for the dumping of human excreta in every direction.

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Surface drainage was provided and the ground was strewn with refuse food, slops, old clothing, etc. The entire settlement was a menance to the health of the residents in the immediate neighborhood. Instructions had been sent Mr. H. Pleasants, the Deputy Inspector for the sub-district, and he was keeping a very strict watch on this settlement.

Complaint of slaughter house at Morrelville.

41. Complaint had been made by affidavit of the insanitary condition of a slaughter house at Morrelville, Cambria county, and Dr. W. E. Mathews, Medical Inspector, had been instructed to make an inspection. His report fully confirmed the complaint which he described as being due to the depositing of the blood, offal and other slaughter house refuse in a stream. He recommended that Messrs. Tomb & Co. be prohibited from polluting this stream with slaughter house refuse. The Secretary had sent Messrs. Tomb & Co. an order to cease making such deposit.

Correspondence with the burgess Coopersdale. Abatement of nuisance. Deputy Inspector, etc.

42. The Secretary read a letter from Mr. Peter Felix, burgess of Coopersdale borough, in reference to the sanitary condition of the town. He had replied and had commended Mr. Felix for the excellent work already done. He had also appointed him a deputy inspector. The Secretary had also sent an order for the abatement of a nuisance at a tallow factory in the borough. He had pointed out to Mr. Felix that this Board had absolutely no authority to compel the construction of sewers, as this power rested entirely with council.

Conference between the Secretary, the Chairman of Committee on Water Supply, etc. with Philadelphia Board of Trade.

43. By request, the Secretary, accompanied by Mr. Howard Murphy, C. E., Chairman Committee on Water Supply, Drainage, Sewerage, Topography and Mines, had held a conference with the committee on water supply of the Philadelphia Board of Trade, and the Committee's report of this conference was now presented. The following preamble and resolutions were recommended by the committee:

Resolutions recommended.

WHEREAS, The epidemic of cholera which has reached the borders of the United States, demands the most energetic and vigorous action at the hands of the proper authorities to prevent its entering Pennsylvania and other States; therefore, be it

Resolved, That the Philadelphia Board of Trade memorialize the Legislature of Pennsylvania to grant to the State Board of Health police jurisdiction over all the drainage areas of Pennsylvania from which water supplies are taken.

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Resolved, That the municipal authorities and trade organizations of Philadelphia and other cities and towns bordering on the Schuylkill river, which take their water supplies from that river and its tributaries, be requested to act with the Philadelphia Board of Trade in obtaining the needed legislation in this vital and important matter.

Prevention of insanitary conditions along the line of the Wilkes-Barre and Eastern railroad.

44. Complaint having been made that a large number of foreign laborers employed in the construction of a line of railroad known as the Wilkes-Barre and Eastern railroad, might cause insanitary conditions in the neighborhood of the health resort of Mt. Pocono, the Secretary communicated with the president of this railroad company. A prompt reply was received from this gentleman, stating that the company had already been in correspondence with Dr. Charles McIntire, Jr., Medical Inspector of Easton, on this subject, and also with Dr. L. H. Taylor, Medical Inspector of the Wyoming district.

The president, Mr. Pyman, further stated that the company would gladly co-operate with the Board in the prevention of any insanitary conditions, and suggested that in the first instance the Board notify all contractors along the line, whose names and addresses were annexed. The Secretary at once addressed a warning communication to all these contractors, eleven in number, pointing out the importance of unusually strict sanitary precautions in regard to the habits of their workmen and laborers in consequence of the danger of the arrival of cholera in this country from Europe. A copy of this letter was now presented and read.

Investigation of water supplied by the Home Water Company of Royersford.

45. A communication had been received from Mr. George D. Peters, burgess of Spring City, Chester county, stating that the water supply of that place supplied by the Home Water Company of Royersford, was contaminated. The Secretary at once wrote the company asking for an explanation. The reply of Mr. J. H. Buckwalter, president, was to the effect that the water supply originally was from an artesian well. This source had, however, owing to the increased demand, became inadequate, and a portion had now to be drawn from the Schuylkill. This was only a temporary arrangement, additional works being now in progress of construction. The residents of Spring City had probably judged the water more by the temperature than from a standard of purity, that from the artesian well being much colder than the Schuylkill water.

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46. A complaint from a resident of Bryn Mawr, Montgomery county, that the Bryn Mawr College contemplated using an abandoned laboratory as a hospital for the reception of contagious diseases, the location of which was likely to endanger the health of residents in the immediate vicinity, was investigated by Dr. W. B. Atkinson, Medical Inspector. His report stated that at present there existed no need for the prohibition of this building for the purpose proposed.

Complaint from Bryn Mawr resident of location of proposed College hospital.

47. A complaint of the insanitary condition of a slaughter house, situated just outside the borough limits of Bolivar, Westmoreland county, was investigated by Dr. W. B. Mathews, Medical Inspector. He reported that all the blood and other filth from this slaughter house was run into a water course, which ran through church property and that of the complainant. The water course was often entirely dry, the slaughter house filth decomposing in it. The whole premises were also in a filthy condition. The Secretary at once sent an order of abatement, which was served by the constable of West Fairfield, who reported on his second visit that the nuisance had been abated.

Slaughter house nuisance near Bolivar.

48. The Secretary read a communication from Dr. C. B. Dudley of Altoona, Medical Inspector, which stated that one of the city reservoirs was being cleansed, and that a quantity of the excavated matter was being so placed, it was feared, that much of the liquid portion would find its way into the reservoir again. The reply of the Secretary which was now read, pointed out the danger of this poisonous organic matter, which probably contained the germs of disease, being allowed to drain into the reservoir. The necessity for having all public water supplies in a condition of the greatest attainable purity during the coming year, in view of the strong probability of the introduction of Asiatic cholera, was also pointed out.

Altoona reservoirs

Mr. Howard Murphy, C. E., moved, Dr. Pemberton Dudley seconded, and it was

Resolved, That it is the sense of this Board that all reservoirs or dams in the State, from which water is drawn for domestic use, should be thoroughly cleansed, as nearly as possible, during the spring of 1893, and that after being made as clean as possible, the bottom and sides or slopes and all surfaces which will come in contact with the water when the reservoir is refilled, be thoroughly

Resolution with regard to cleaning of reservoirs.

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whitewashed or otherwise treated with as thorough an application as possible of lime. This recommendation applies to reservoirs and dams with earthen surfaces as well as to reservoirs which are paved or lined. In all cases the silt and other débris and material removed from any reservoir or dam should be so disposed of as to preclude the possibility of its being again washed into the water supply by storms or otherwise.

On motion of the same gentleman, seconded by Dr. George G. Groff, it was ordered that a copy of the above resolution be sent to Dr. C. B. Dudley.

Small-pox at Allentown, from New York.

49. On the 30th of October the Secretary was notified of a case of small-pox at Allentown, Lehigh county, in an Italian shoe black, who had recently visited the city of New York to attend the Columbian Fete. Dr. J. C. Christman, health officer, stated that the case was promptly isolated by removal to the county pest house, bedding destroyed, and house fumigated and quarantined. The Secretary had mentioned eighteen days as the proper period to quarantine in case no other person was taken sick.

This was the second case of infection with small-pox at the New York festival.

Paper by Dr. John B. Hamilton.

50. The Secretary presented a copy of a paper by Dr. John B. Hamilton, Surgeon U. S. Marine Hospital Service, on the "Establishment of a National Quarantine Station near New York Harbor." The further consideration of the paper was referred to new business.

Death of Dr. Thomas F. Wood.

51. H. T. Bahnson, Esq., President of the State Board of Health of North Carolina, had notified the Secretary of the death of Dr. Thomas F. Wood, Secretary of that Board. On motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, the Secretary was directed to express the sympathy of this Board, with the North Carolina Board, in view of the decease of Dr. Wood.

Dumping of garbage into Ohio river.

52. Mr. J. O. Brown, Chief of the Department of Public Safety of Pittsburg, had asked the advice of the Secretary with regard to dumping of garbage into the Ohio river. The current being very slow at the place where the matter was dumped, the water was in danger of being seriously contaminated. He suggested dumping the stuff below Davis Island dam.

The Secretary had replied expressing surprise that such a condition of affairs existed in Pittsburg, and absolutely condemned the present system of garbage dis-

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posal and recommended either dumping the same below Davis Island dam, or still better, subjecting it to rapid oxidation in the crematory owned by the city.

Drainage into abandoned coal mines.

53. Mr. Grosby Gray, Chief Clerk Department of Public Safety of the same city had reported that for some years several residents of the Thirty-first and Thirty-second wards of Pittsburg had been getting rid of their drainage by the drilling of holes in the earth, through the roofs of abandoned coal mines. An ordinance prohibiting the dangerous practice had recently been introduced to council by his department, but had met with violent opposition.

On the motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, it was

Condemning the same.

Resolved, That the disposing of sewage in abandoned mines or wells, quarries or other limestone caverns, especially in limestone regions, be condemned. On motion of Mr. Howard Murphy, C. E., seconded by Dr. Pemberton Dudley, it was ordered that a copy of the above resolution be sent to Mr. Crosby Gray.

Inspection of Carnegie Steel Company's Works.

54. The Secretary presented a copy of the report of himself and Dr. J. H. McClelland on an inspection of the Carnegie Steel Company's Works, at Munhall Station near Homestead, which showed that the charges of defective drainage and improper disposal of garbage made by the borough council of Homestead, were unfounded.

Communication from Mr. F. W. Brewer.

55. The Secretary presented a communication from Mr. F. W. Brewer, Superintendent Bureau of Hygiene and Sanitation, World's Columbian Exposition, with reference to the exhibit of this and other State Boards of Health. After some discussion it was

Models for exposition.

Resolved, On motion of Dr. Benjamin Lee, seconded by Mr. Howard Murphy, C. E., that Dr. M. L. Davis be requested to place his model for cremation of garbage and dead bodies, and other sanitary appliances at the disposal of the State Board of Health of Pennsylvania, to form a portion of the exhibit of said Board at the World's Columbian Exposition.

Inspection of Titusville.

56. The Secretary presented the report of Col. Thomas B. Roberts, C. E., Engineer Inspector of the Western district, on inspection of Titusville, Crawford county, with reference to its insanitary condition from defective drainage, caused in part by the recent fire and flood calamity. This report had been submitted to the Chairman of the Committee on Water Supply, Drainage, Sew-

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erage, Topography and Mines. Mr. Howard Murphy C. E., now moved, and Dr. George G. Groff seconded, that on account of the report of Colonel Roberts containing matter foreign to the purposes for which this Board was established, that it be omitted from the annual report, and the Secretary so notify Colonel Roberts. The motion was carried

Inspection of Clarion public school.

57. The Secretary submitted a report of the sanitary inspection of the public school at Clarion, Clarion county, by J. H. Greenland, Esq., Secretary Board of Health of Clarion.

The following complaints have been investigated and acted on by correspondence:

Complaints acted on by correspondence.

58. Knoxville, Tioga county, slaughter house.
59. Irvona, Clearfield county, defective drainage.
60. West Grove, Chester county, slaughter house.
61. Fallsington, Bucks county, hog pen.
62. Falls Creek, Jefferson county, slaughter house.
63. Millerstown, Perry county, drainage from tannery.
64. Huntingdon, Huntingdon county, pollution of stream.
65. South Bethlehem, Northampton county, pollution of creek.
66. Punxsutawney, Jefferson county, filthy sewer.
67. Cresson, Cambria county, slaughter house.
68. New Salem, Fayette county, slaughter house.
69. Bridgeport, Montgomery county, impure water.
70. Leechburg, Armstrong county, pollution of stream.
71. Catasauqua, Lehigh county, slaughter house.
72. Suterville, Westmoreland county, defective drainage.
73. Apollo, Armstrong county, slaughter house.
74. Narberth, Montgomery county, cesspools.
75. Wallingford, Delaware county, insanitary conditions.
76. Clearfield, Clearfield county, insanitary conditions.
77. Wayne, Erie county, pig pen.
78. Spring Forge, York county, insanitary conditions.
79. Steelton, Dauphin county, pollution of river.
80. Hopbottom, Susquehanna county, creamery nuisance.
81. Perkiomen Junction, Montgomery county, slaughter house.
82. Pottstown, Montgomery county, pig pen.
83. Mill City, Wyoming county, pollution of stream.

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84. Millvale, Allegheny county, slaughter house.

85. Susquehanna, Susquehanna county, defective drainage.

86. Washington, Washington county, impure water.

87. Braddock, Allegheny county, open sewer.

88. Radnor, Delaware county, insanitary conditions.

89. Scranton, Lackawanna county, pollution of stream.

90. Slippery Rock, Butler county, typhoid at Normal School.

91. Flushing, Bucks county, dead horse in Neshaminy creek.

92. Tyrone, Blair county, defective drainage.

93. Freeland, Luzerne county, insanitary conditions.

94. The financial report showed that the expenditures of the Board since the November meeting last year had been three thousand nine hundred and eighty-seven dollars and forty cents ($3,987.40), and that there was a balance in the treasury of twelve dollars and seventy-five cents ($12.75). Financial report.

The appropriation still due the Board for the two quarters commencing December 1, was two thousand dollars ($2,000).

95. The total number of written communications received during the past year were 2,566. The total number sent during the same period was 2,186. Correspondence.

96. The total number of circulars distributed during the year had been 49,824, including 1,275 box envelopes, each containing eighteen circulars. Circulars sent.

The following new circulars had been issued during the same period: New circulars.

No. 34. On the treatment of the apparently drowned and suffocated.

No. 35. On the Prevention of Blindness.

No. 36. On Sanitary Protective Associations.

A special circular letter of instructions on Asiatic cholera had also been issued to Boards of Health and Health Authorities in Pennsylvania.

Eight thousand of these circular letters were distributed.

Circular No. 22, on Precautions against Trichinosis had been revised, both in German and English. Circulars translated.

97. The additions to the library of the Board during the year 1892 had been: Additions to library.

Books received as exchanges,	88
Books purchased,	11
Pamphlets received as exchanges,	35

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V. Reports of Standing Committees being in order: Reports of Standing Committees.

1. Dr. Pemberton Dudley, Chairman of the Executive Committee, reported that since the last annual meeting of the Board in November, 1891, four regular meetings and two special meetings of that Committee had been held, when vouchers numbered 487 to 558, amounting to $3,984.19, were examined and approved.

On motion of Dr. George G. Groff, seconded by Mr. Howard Murphy, C. E., the report was accepted and approved.

2. There was no report from the Committee on Registration and Vital Statistics.

3. Dr. J. F. Edwards, Chairman of Committee on Preventable Diseases, Disinfection and Supervision of Travel and Traffic, had communicated with the Secretary, stating that owing to a recent affliction he was unable to attend the meeting, and his report was not yet completed. He asked that a special board meeting be held later to consider the same.

4. Mr. Howard Murphy, C. E., Chairman Committee on Water Supply, Drainage, Sewerage, Topography and Mines, made a verbal report in part only. He stated that arrangements for the contemplated conference to be held at Reading were being completed. Some delay had been occasioned by the recent national election. A general discussion now ensued in reference to the organization and date of this conference. It was suggested that a preliminary meeting be held as soon as possible with the view of organizing, and that the date of the proposed general conference should be fixed on or about January 15, 1893. These suggestions were acquiesced in by Mr. Murphy.

5. Dr. George G. Groff, Chairman Committee on Public Institutions and School Hygiene, reported that in pursuance of the orders of the Board circular No. 33 on school hygiene had been revised and is now in the Secretary's hands ready for printing. Circular No. 26 would be revised when the present supply was exhausted. He had visited and made addresses at teachers' institutes during the year. The attention of the trustees of the State penal institutions had also been called to the importance of exercising due care in restricting the spread of pulmonary tuberculosis among the inmates thereof.

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The Committee now deemed the restriction of contagious disease and the proper care of the eyes as the matters now needing most attention in the public schools, and a special letter to teachers and superintendents on these subjects was appended herewith.

On motion of Dr. Pemberton Dudley, seconded by Dr. Samuel T. Davis, the report was accepted and approved.

6. Dr. Pemberton Dudley, Chairman Committee on Adulterations, Poisons, Explosives and other Special Sources of Danger to Life and Limb, stated he had no report to present.

7. Hon. Samuel T. Davis, Chairman Committee on Sanitary Legislation, Rules and Regulations, reported that measures had been taken to arrange and prepare such bills as it was thought proper to present at the coming meeting of the Legislature. He would ask the Board to meet his Committee in special session before the convening of the Legislature for the purpose of having the action of the Committee approved.

On motion of Dr. Benjamin Lee, seconded by Dr. George G. Groff, the report was accepted and the recommendations contained therein adopted.

Reports of Special Committees.

VI. Reports of Special Committees being next in order, Mr. Howard Murphy, C. E., Chairman Committee on Determining the Dividing Line Between the Eastern and Western Engineering Inspection Districts, reported verbally that in the absence of Dr. J. H. McClelland in Europe he had not had an opportunity of conferring with him in reference to this matter.

Appointment of Standing Committees for ensuing year.

VII. The appointment of Standing Committees for ensuing year being in order, the President announced that the Committees would remain as during the preceding year except that according to custom he would withdraw from his position on committees which would be taken by the retiring President. By special request of the Board, however, he consented to remain as Chairman of the Committee on Medical Legislation. The Committees therefore stand as follows:

I. Executive Committee—Pemberton Dudley, M. D., Chairman, Howard Murphy, C. E., Joseph F. Edwards, M. D., and Benjamin Lee, M. D., Secretary.

Place of meeting, Executive office, 1532, Pine street, Philadelphia.

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Secretary's address, 1532 Pine street, Philadelphia.

II. Committee on Registration and Vital Statistics—Dr. J. H. McClelland and Dr. Benjamin Lee.

Bureau of Registration and Vital Statistics, Department of Internal Affairs, State Capitol, Harrisburg.

State Superintendent of Registration of Vital Statistics—Benjamin Lee, M. D.

Registrars of Marriages—All clerks of orphans' courts.

Registrars of Practitioners of Medicine and Surgery—All prothonotaries.

III. Committee on Preventable Diseases, Disinfection and Supervision of Travel and Traffic—Dr. Joseph F. Edwards and Dr. Pemberton Dudley.

IV. Committee on Water Supply, Drainage, Sewerage, Topography and Mines—Mr. Howard Murphy, C. E., and Dr. George G. Groff.

V. Committee on Public Institutions and School Hygiene—Dr. George G. Groff and Dr. J. F. Edwards.

VI. Committee on Adulterations, Poisons, Explosives and other Special Sources of Danger to Life and Limb.—Dr. Pemberton Dudley and Mr. Howard Murphy, C. E.

VII. Committee on Sanitary Legislation, Rules and Regulations—Dr. Samuel T. Davis and Dr. Pemberton Dudley.

The President is a member ex-officio of all committees.

Unfinished business.

VIII. Unfinished business being next in order, on motion of Dr. Benjamin Lee, seconded by Dr. Pemberton Dudley, it was

Laboratory of Hygiene.

Resolved, That the directors of the Laboratory of Hygiene of the University of Pennsylvania be requested to make a report to the State Board of Health from time to time of investigations conducted in the Laboratory in the interests of the public health, said reports to be printed in the annual report of the Board, and a certain number of reprints to be furnished for the use of the directors.

Thanks to Medical Inspector R. Thompson.

Resolved, That a special vote of thanks be given to Dr. J. R. Thompson, Medical Inspector of the Allegheny district for making an inspection at Coudersport in regard to an outbreak there of small-pox outside the limits of his own district, and at great personal inconvenience.

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The recommendations of the Finance Committee with regard to the cost of distributing the Board's annual reports were now brought up. The committee recommended that the Board investigate the matter of the cost of distributing the annual reports of the other departments of the State Government with a view to the expense thereof being met in some other way than out of the Board's limited appropriation.

Cost of distribution of annual reports.

On motion of Dr. George G. Groff, seconded by Dr. Samuel T. Davis, the Secretary was instructed to investigate in accordance with the foregoing recommendations.

In the matter of the fee per diem allowed to Medical Inspectors in making inspections in case of epidemic diseases, it was, on motion of Dr. Benjamin Lee, seconded by Dr. George G. Groff,

Fees to Inspectors.

Resolved, That the Secretary be authorized to offer at his discretion, increased compensation for inspections in cases of outbreaks of small-pox, Asiatic cholera, typhus fever and yellow fever, the fee, however, not to exceed fifteen dollars per diem. The Secretary brought up the subject of the re-affirmation of Regulation III on the Sanitary Supervision of Travel and Traffic, suggesting that the same be reaffirmed owing to its having been previously omitted from the minutes. On motion of Dr. George G. Groff, seconded by Dr. Pemberton Dudley, it was so ordered.

On motion of Dr. Benjamin Lee, seconded by Dr. George G. Groff, the Committee on Sanitary Legislation, Rules and Regulations was instructed to prepare a bill for introduction at the coming meeting of the Legislature creating, an emergency fund, to be used in case of serious epidemics of disease and disasters, at the discretion of His Excellency the Governor.

Legislation for emergency fund.

On motion of Dr. Benjamin Lee, seconded by Dr. George G. Groff, it was

Resolved, That the paper prepared by Dr. John B. Hamilton on the establishment of a National Quarantine Association near New York harbor, be printed in the Board's annual report. Dr. George G. Groff moved, Mr. Howard Murphy, C. E., seconded, and it was ordered that the Secretary prepare an itemized account of all the Board's expenses in connection with the recent Asiatic cholera scare, for presentation to the Legislature.

Paper by Dr. John B. Hamilton.

Cholera expenses.

The following preamble and resolution were introduced

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by Dr. Pemberton Dudley and seconded by Dr. George G. Groff:

WHEREAS, The history of all known epidemics of Asiatic cholera shows the strong tendency of that disease to recur for two or more successive years;

And whereas, It is perfectly reasonable to apprehend the danger of the introduction of choleraic infection in a latent condition into this country during the coming winter and spring;

And whereas, The approaching Columbian Exposition furnishes a special occasion for the utmost sanitary precautions during the coming twelve months; therefore,

Committee on cholera.

Resolved, That a special committee of this Board be appointed to consider what action the Board should take in reference to the possible advent of cholera next summer, said committee to report at a special meeting.

The preamble and motion were carried.

On motion of Dr. Benjamin Lee, seconded by Dr. George G. Groff, it was

Right of eminent domain.

Resolved, That the Committee on Sanitary Legislation, Rules and Regulations be directed to prepare a bill giving the right of eminent domain to sewerage companies for introduction at the next meeting of the Legislature.

New business.

New business being next in order, the arrangements for a sanitary convention for 1893 were considered. In this connection the Secretary read a communication from Mr. W. J. Atwood, president of the Funeral Directors' Association of the State of Pennsylvania, asking the Board to hold the next sanitary convention in the city of Scranton simultaneously with their meeting in the month of June. On motion of Mr. Howard Murphy, C. E., seconded by Dr. George G. Groff, it was

Sanitary convention.

Resolved, That no sanitary convention be held during 1893, but that the annual address of the Board be delivered before the State Legislature at Harrisburg.

Presentation of vouchers.

The Secretary presented vouchers numbered 542 to 558, amounting to $978.40, which had been submitted to and audited by the Executive Committee. Dr. Pemberton Dudley moved, and Dr. George G. Groff seconded, that the vouchers be approved. It was carried.

Presentation of accounts.

The Secretary submitted a statement of accounts owing by the Board, and amounting to $1,658.84, which had also been examined and approved by the Executive Committee. On motion of Dr. George G. Groff, seconded by

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Mr. Howard Murphy, C. E., these accounts were approved.

The Secretary reported that circular No. 7 on cholera, etc., was being translated into German, and also into the Bohemian languages. Circular No. 20, on contagious and infectious diseases, was also being translated into the Bohemian tongue.

Appointment of Inspector for Western Slope district.

In consequence of the resignation of Dr. Spencer M. Free, Medical Inspector for the Western Slope district, owing to his having removed from this district, it became necessary for the Board to appoint a successor. Dr. Free had recommended Dr. John Torbert, of Driftwood, as a suitable person. Dr. Benjamin Lee nominated Dr. John Torbert; Mr. Howard Murphy, C. E., seconded the nomination. On motion of the last named gentleman, seconded by Dr. Pemberton Dudley, the President declared Dr. John Torbert duly elected Medical Inspector for the Western Slope district.

Deputy Inspectors in cholera emergency.

The Secretary presented a list of persons who had been appointed Deputy Inspectors throughout the State, to meet the recent cholera emergency confronting the Board as follows:

September 3d, C. A. Stewart, Braddock district, North Versailles township, Allegheny county. September 6th, Dr. Chas. M. Shaffer, Forward district, Forward township, Allegheny county. September 17th, Dr. John T. Heaps, Delta district, Peach Bottom township, York county. Henry Pleasants, Radnor district, Radnor township, Delaware county. J. O. Brown, Allegheny county district, Allegheny county. September 24th, James H. MacEl'Rey, Lower Chichester district, Delaware county. Thomas H. Price, Versailles district, Versailles township, Allegheny county. September 26th, Jos. McClusky, North Versailles district, North Versailles township, Allegheny county. September 26th, Dr. D. G. Foster, Chartiers Valley district, townships adjacent to Chartiers creek, Allegheny county. September 29th, Dr. W. W. Fletcher, Oakland district, Oakland and Harmony townships, Susquehanna county. Dr. J. R. Gilmore, Noyes district, Noyes township, Clinton county. Dr. Thomas M. Cooley, Sandy Lake district, Sandy Lake township, Mercer county. Dr. Mark H. Lincoln, Harrison district, Harrison township, Allegheny county. October 3d, Dr. Casper Morris, Special Medical Inspector Philadelphia and Reading railroad—Dr. Darwin Kelly, Falls district,

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Falls township, Wyoming county—W. S. Bennett, East Deer district, East Deer township, Allegheny county. October 5th, Dr. R. W. Battles, Girard district, Girard township, Erie county. October 12th, Dr. J. N. McCune, Sewickley district, Sewickley township, Westmoreland county—Dr. A. S. McKnight, Freeland district, Foster, Hazel, Butler and Denison townships, Luzerne county—Dr. C. S. Logan, Bliss district, Bliss township, Tioga county. October 13th, J. W. Greeland, Clarion district, Clarion township, Clarion county. October 15th, Dr. George L. Berwick, Patton district, Patton township, Allegheny county. October 20th, Wm. E. Mumaw, Hazle, Banks and Kline townships, Luzerne, Carbon and Schuylkill counties—Dr. J. R. Johns, Birmingham district, Birmingham township, Delaware county and Birmingham, Pennsbury and Pocopson townships, Chester county. October 26th, Samuel Newton, Fayette district, N. and S. Fayette townships, in part, Allegheny county. October 22d, Peter Felix, Taylor district, Taylor township, Cambria county. October 29th, Lincoln R. Leeds, Coatesville district, Coatesville township, Chester county (temporary). October 31st, Dr. W. Brown Ewing, Kilbuck district, Kilbuck township, Allegheny county. November 3d, Dr. E. D. Schnabel, Bethlehem district, Lower Saucon, Hanover and Bethlehem townships Northampton county, Hanover township, Lehigh county. The appointments were confirmed.

On motion of Mr. Howard Murphy, C. E., seconded by Dr. Pemberton Dudley, it was

Assessment by National Conference State Boards Health.

Resolved, To appropriate the sum of thirty dollars for payment of the assessment by the National Conference of State Boards of Health, for expenses incurred by the Quarantine Commission Committee.

Adjournment

On motion the Board then adjourned to meet at the call of the President.

BENJAMIN LEE,
Secretary.

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PART II.

APPENDICES.

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PART II.

APPENDICES.

Appendix A. Reports of Standing Committees.
Appendix B. Reports of Inspections.
Appendix C. Quarantine, Disinfection, Epidemics and Special Sources of Disease.
Appendix D. Reports of Conferences and Conventions.
Appendix E. Complaints and Orders for Abatement of Nuisances.
Appendix F. Circulars and Forms.
Appendix G. Annual Reports of Cities and Towns.
Appendix H. Meteorological Observations.
Appendix I. Correspondence and Legal Opinions.
Appendix K. By-Laws, Organization, etc.
Appendix L. Additions to the Library.
Appendix M. Report of the State Pharmaceutical Examining Board.

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APPENDIX A.

1. Report of the Executive Committee, Pemberton Dudley, M. D., Chairman.
2. Report of the Committee on Public Institutions and School Hygiene, George G. Groff, M. D., Chairman.

1.—REPORT OF EXECUTIVE COMMITTEE.

The Executive Committee beg to report that since the last annual meeting of the Board in November, 1891, four regular meetings and two special meetings of the committee have been held, as follows:

February 22, 1892, regular meeting, held at Philadelphia.
March 28, 1892, special meeting, held at Erie.
May 13, 1892, special meeting, held at Harrisburg.
July 11, 1892, regular meeting, held at Harrisburg.
August 13, 1892, regular meeting, held at Philadelphia.
November 10, 1892, regular meeting, held at Harrisburg.

Vouchers, numbered 487 to 558, amounting to $3,984.19, were examined at these meetings and approved.

Respectfully submitted.

PEMBERTON DUDLEY,
Chairman of Executive Committee.

2.—REPORT OF COMMITTEE ON SCHOOLS, PUBLIC BUILDINGS, ETC.

The committee reports that during the year a circular on "School Hygiene" (No. 2), addressed to school directors, trustees and controllers, was prepared and distributed largely throughout the State. During the year every city and county superintendent of schools was communicated with in reference to the sanitary conditions of the schools under their charge, and circulars were distributed where the same was requested.

Visits were made to a number of County Teachers' Institutes, and addresses made to the school directors on the importance of proper sanitary conditions about the school premises. Several addresses were also made to school teachers in these conventions on the same subject.

Your committee recommends that circulars Nos. 1 and 2, on School Hygiene, be revised.

Respectfully submitted.

GEO. G. GROFF,
Chairman.

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APPENDIX B.

REPORTS OF INSPECTIONS.

1. Inspection at Pottstown, Montgomery county, by Wm. B. Atkinson, M. D., Medical Inspector.
2. Inspection at Nanticoke, Luzerne county, by L. H. Taylor, M. D., Medical Inspector.
3. Inspection at Ardmore, Montgomery county, by Wm. B. Atkinson, M. D., Medical Inspector.
4. Inspection at Philipsburg, Centre county, by C. B. Dudley, M. D., Medical Inspector.
5. Inspection at Bristol, Bucks county, by Wm. B. Atkinson, M. D., Medical Inspector.
6. Inspection at Lansdowne, Delaware county, by Wm. B. Atkinson, M. D., Medical Inspector.
7. Inspection at Ogontz, Montgomery county, by Wm. B. Atkinson, M. D., Medical Inspector.
8. Inspection at Pennsylvania Military Academy, near Chester, Delaware county, by Wm. B. Atkinson, M. D., Medical Inspector.
9. Inspection at New Hope, Bucks county, by Wm. B. Atkinson, M. D., Medical Inspector.
10. Inspection at Devon and Berwyn, Chester county, by Wm. B. Atkinson, M. D., Medical Inspector.
11. Inspection at Coudersport, Lycoming county, by J. R. Thompson, M. D., Medical Inspector.
12. Inspection at Birdsboro, Berks county, by Wm. H. Boardman, C. E., Engineer Inspector.
13. Inspection at Norwood, Delaware county, by Wm. B. Atkinson, M. D., Medical Inspector.
14. Inspection at Chadd's Ford, Delaware county, by Wm. B. Atkinson, M. D., Medical Inspector.
15. Inspection at Norristown, Montgomery county, by Wm. B. Atkinson, M. D., Medical Inspector.
16. Inspection at Trainer, Delaware county, by Wm. B. Atkinson, M. D., Medical Inspector.
17. Inspection at Muncy, Lycoming county, by George G. Groff, M. D., Member of the Board.
18. Inspection at Wayne, Delaware county, by Wm. B. Atkinson, M. D., Medical Inspector.
19. Inspection at Pittsburg, Allegheny county, by Benjamin Lee, M. D., Secretary of the Board.
20. Inspection at Johnsonburg, Elk county, by Spencer M. Free, M. D., Medical Inspector.
21. Inspection at McKeesport, Allegheny county, by J. R. Thompson, M. D., Medical Inspector.
22. Inspection of drainage of Lansdowne, Delaware county, by Wm. H. Boardman, C. E., Engineer Inspector.

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23. Inspection at New Castle, Lawrence county, by J. R. Thompson, M. D., Medical Inspector.
24. Inspection at Bryn Mawr College, Delaware county, by Wm. B. Atkinson, M. D., Medical Inspector.
25. Inspection at Homestead, Allegheny county, by Benjamin Lee., M. D., Secretary of the Board.
26. Inspection at Coopersdale, —— —— county, by Peter Felix, Esq., burgess.
27. Inspection at Morrellville, Cambria county, by W. E. Matthews, M. D., Medical Inspector.
28. Inspection at Bolivar, Westmoreland county, by W. E. Matthews, M. D., Medical Inspector.
29. Inspection of the Clarion Public School, Clarion county, by J. W. Greenleaf, Secretary of the Clarion Board of Health.

1.—INSPECTION AT POTTSTOWN, MONTGOMERY COUNTY, SUBJECT OF COMPLAINT, GENERAL DRAINAGE AND SEWERAGE.

By W. B. ATKINSON, M. D., *Medical Inspector.*

PHILADELPHIA, *November 21, 1891.*

The place has a population of 15,000. It is built in the valley of the Schuylkill river, where the great majority of the dwellings, etc., are located. The better class of dwellings are on the hills above this valley. The place is drained naturally, by three runs, Tanyard, Hubley's and Goose run. A special charter was granted the city in 1815, which limits its power of borrowing money to $5,000, nor can the tax be increased without a vote of the citizens. There is no law of any kind relative to drainage. At least 500 houses or other places drain by sewers into these runs. The others have the ordinary surface drainage, and also have ordinary cesspools which are cleaned out at irregular intervals. Most of the slaughter houses drain into these runs. There are twelve of these establishments in the place. Each of the runs shows large quantities of blood, offal and other filth flowing or lying through their entire length. There are no traps at any point to prevent the outflow of sewer gas, but all the inlets are open, and all without any effort to enable them to be kept clean. The bottoms of the sewers are not in any way built or prepared to carry off the contents, but are merely the ordinary stone or earth as placed at the bottom of the run by nature, so that filth of a solid or tenacious character is likely to remain attached to any projection or roughness, till it is sufficiently decayed to float further down. Hence only heavy rains can cause the flushing of these runs, and the accumulations remain to putrefy and fill the air constantly with noisome odors. Although the temperature was low at the time of my inspection, the odors of decaying matter were quite perceptible.

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In the locality drained by these runs, there is a continual endemic of typhoid fever. Every opportunity is afforded for the spread of disease. At present there only is lacking the spark to fire the train. Should a dearth of water occur, undoubtedly disease would at once result from the air being filled with germs from these culture beds. These runs also gather much filth, garbage, etc., from the farms and vegetation through which they run in their approach to the city.

A low form of diarrhœa fermentative in form, has for the last three years attacked rows of houses in the place.

In addition, the highways are filthy, the back alleys show accumulations of filth, and there is a general lack of sanitary policing which is disgraceful to a place of this importance.

It is of the greatest importance that a proper system of drainage and sewage should at once be instituted. That the authorities should compel a thorough policing of the valley part of the city. These changes and nothing else can secure the citizens from the constant risk of a dangerous epidemic which may attack them at no distant day.

All which is respectfully submitted.

2.—INSPECTION AT NANTICOKE AND RED TAVERN, LUZERNE COUNTY.

By L. H. TAYLOR, M. D., *Medical Inspector.*

(*a.*) PRELIMINARY REPORT ON TYPHOID FEVER AT NANTICOKE AND RED TAVERN, LUZERNE COUNTY, PENNSYLVANIA.

WILKES-BARRE, PA., *January 1, 1892.*

Accompanied by Dr. S. L. Holly, of Nanticoke, I visited the place known as the "Red Tavern," had an interview with Mr. T., looked over his premises carefully and procured a sample of the water from his well, which I forwarded by Adams express to Dr. Leffmann for examination.

Mr. T. keeps a dairy of thirteen cows, from which he supplies milk to customers in the borough of Nanticoke. He is the milkman supposed by many to have distributed typhoid fever among many of the residents of the place. Two years ago a passing drove of cattle halted at Mr. T.'s place and pastured on his farm about a week. In about two weeks after his own cows began to be ill, and the whole herd of thirteen died in a short time. This was investigated by the State Board of Agriculture, and the disease pronounced Texas fever.

Mr. T. has lived in his present location seven years, and his family has had no serious illness in that time until October, 1891. He was taken sick October 4, and was ill with typhoid fever for seven weeks. His son, H. T., aged five, also taken sick October 4, was ill four weeks.

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L. S., aged fifteen, a relation in the same house, was taken sick October 7, and was ill for three weeks.

Mrs. C. T., taken sick October 11, ill three weeks. C. S., aged twenty, a relative who came to the house soon after Mr. T.'s illness began about one week, was taken sick November 26, and is still in bed, though now convalescing. These all had well-marked typhoid fever.

Mr. T. does not know of any typhoid fever occurring previously in this house, and thinks there has been none for twenty-five years. Himself and family, with others, have used the water from his well constantly until taken ill, and then the sick ones were supplied with water carried from a spring some distance away. The other end of the house, "Red Tavern," is occupied by another family who use the water from the T. well. At present three are ill, but their attending physician did not pronounce the disease *typhoid fever*. The first of these, George K., aged twenty-nine, was taken ill on Thanksgiving day. Had headache, nose bled and diarrhœa. He was ill three or four weeks, was then up about four days, and is now down again.

Mrs. E. K. was taken ill November 28 with "inflammatory cold," sick two weeks, up three or four days, and then "took cold, had a relapse with pneumonia" (?). She is now quite ill, very dull and sluggish, sordes on teeth, dry tongue, etc. These people used the T. well water till illness began, and since then have used spring water. In a house a few yards away a family of three lived, and also used water from the T. well. None of them were reported as having typhoid. A daughter, aged twenty, died October 12, 1891; said to have died of heart disease.

The pupils of a public school, situated a short distance above the "Red Tavern," were supplied with drinking water from the T. well up to the outbreak of the fever, but so far as known none of them contracted the disease.

This local outbreak is of great interest of itself, aside from any influence it may or may not have had on the spread of the disease in Nanticoke, and the query naturally arises, what was the source of the infection? Mr. T. states that none of his family had been away from home for some time, except himself. He had been in Beach Haven about September 1, and staid two nights, but did not know of any typhoid fever being there at the time. He sold milk in Nanticoke daily, and drank freely of the water. His wife, who contracted the disease within a week of himself, had not been away at all, nor had his child. The other two, L. S. and C. S,, came from Berwick to the "Red Tavern" and contracted the disease sometime after their arrival. Thus far the origin of the disease is obscure. A possible explanation may be found in the following facts, which need further investigation.

Mr. K., a huckster from Beach Haven, frequently passed through this neighborhood and stopped with Mr. T. He was there and spent a night about September 1, and again about September 15. At the time of the

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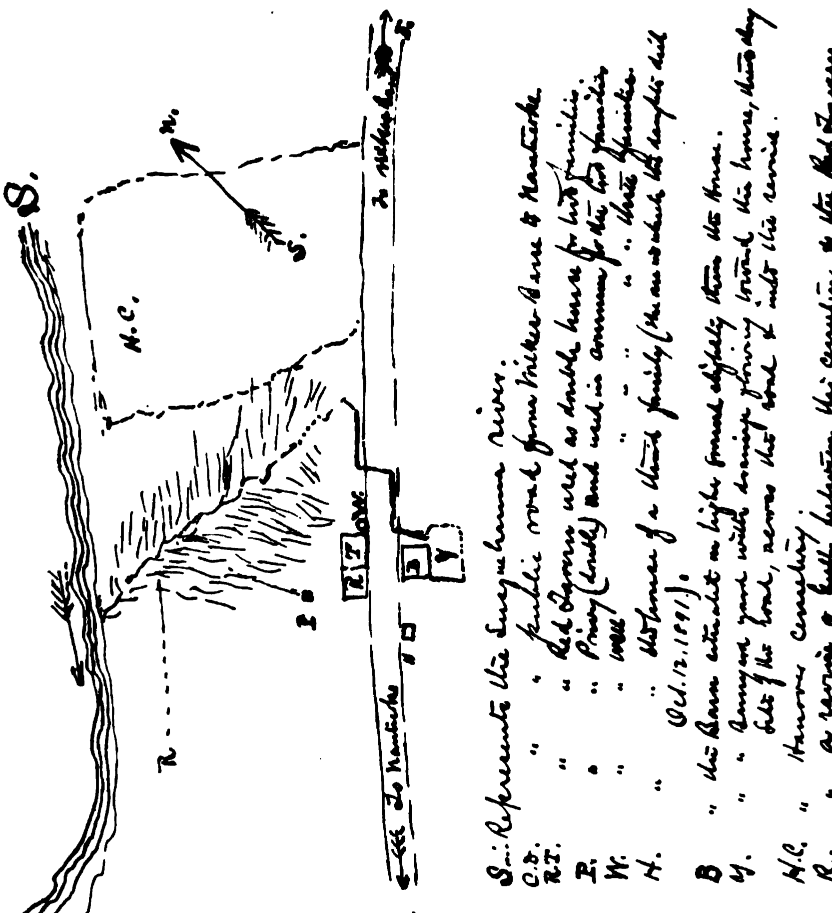
latter visit he was complaining of headache, general aching, lassitude, etc. He went directly home, was immediately taken down with typhoid fever and was ill four weeks. It is quite possible that he was commencing with the disease at the time of his visit, and if so, his would serve as the parent case at the T. place. After the patients had been ill for a short time a nurse was procured and the stools disinfected, but previously they had been thrown into the privy, which is situated below the well so far as surface is concerned, and on ground sloping toward the river and away from the house and well.

The privy is situated 45 feet from the rear of the house and 120 feet from the well, the ground sloping toward the privy, so that it is considerably below the top of the well. Remarkable circumstance for a house in the country.

The accompanying crude diagram may possibly give you an idea of the location of the various points.



Appearances would indicate that the privy would not pollute the well. The latter is twenty-four feet deep. I do not know the dip of the strata, but Mr. T. assures me that he ascertained when cleaning the well that the water came into it from the opposite side to the privy, *i. e.*, from toward the barn. There is a shallow ravine or gully between the Red Tavern and the cemetery, the ground sloping toward it from each side. Over in the cemetery, on the opposite side of the ravine, estimated 250 yards away, where the sexton was digging a grave, the dip of the rock is toward the Red Tavern. The sexton, who has lived within the cemetery grounds for three years, thinks there have been no burials of typhoid cases within some years until the present month when a case from Nanticoke was buried there.

I have addressed the following letter to each of the physicians of Nanticoke, requesting them to respond to the following questions in the interest of the State Board of Health:

WILKES-BARRE, Pa., *December* 28, 1891.

MY DEAR DOCTOR: Will you kindly give me, on behalf of the State Board of Health, at your earliest convenience, the following information concerning the prevalence of typhoid fever in Nanticoke?

1. Have you treated any cases of typhoid in Nanticoke since October 1, 1891? If so, how many?

2. Please give name, age, sex, residence, date of attack and result of treatment of each. I assure you no names will be published.

3. Will you please state what water supply was used by each, whether the public supply or well water? Also the milk supply of each? From whom obtained? Were any of your patients in the habit of boiling their drinking water before using?

4. What method of disinfecting stools was used, if any?

5. Was the house connected with sewers? If not, in what way is refuse disposed of?

6. What is the general sanitary condition of the neighborhood in which the cases occurred?

7. Did you attend any cases of typhoid in Nanticoke in the past summer, prior to October 1?

I will consider it a personal favor if you will reply to this at your earliest convenience. Any other information you may be able to give on the subject will be gladly received.

Very truly yours.

I have already had several interesting replies, of which, later.

I will pursue this investigation as rapidly as possible and report to you from time to time. In the meanwhile I shall anxiously await the report of the chemist on the sample of water sent. I trust this may be conclusive as to the condition of the well, and that we may know definitely by culture experiments whether any typhoid bacilli are found.

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(*b.*) ANALYSIS OF WATER FROM RED TAVERN.

The following are the results of an examination of a sample of water sent by Dr. L. H. Taylor, Wilkes-Barre, Pennsylvania, marked T——'s well:

Chlorine,	50.40
Nitrogen as nitrates,	12.60
Nitrogen as nitrites,	None.
Nitrogen as ammonium,	0.005
Nitrogen by permanganate,	0.080

Clear and colorless.

The above results correspond with those usually obtained in the examination of well waters in populated districts, in which the subsoil water is largely polluted by infiltration of foul matters, but in which the soil is still capable of oxidizing the organic material to the final point, *i. e.*, nitrates. The high figure for the nitrates and chlorides, the low figure for the organic matters and ammonium compounds, and the entire absence of nitrites indicate these conditions. Notwithstanding the fact that the ingredients in this water are not positively injurious, I regard it as unsafe for drinking purposes, because of the evidences of previous contamination, which may become at any time too great to be properly removed by the soil action. In addition, the introduction of specific contamination, such as the bacillus typhosus, is liable to occur and distribute the disease among those using the water. All figures in the analysis are in parts per million. Yours,

HENRY LEFFMANN.

(*c.*) SUPPLEMENTARY REPORT BY DR. TAYLOR.

WILKES-BARRE, PA., *January* 15, 1892.

My former report under date of January 1, 1892, dealt almost exclusively with the disease at the "Red Tavern," so this need not be mentioned in detail in my present report.

Early in the month of October a number of cases of typhoid fever appeared in Nanticoke, many of them from a sanitary point of view, in the upper or best portion of the town. New cases appeared from time to time, through October and November and on into December; but it was not until the disease had practically stopped spreading that the attention of the State Board of Health was called to the matter and requested to investigate the same. I began my investigations the next day December 26, after receiving your order, and on December 28, addressed letters to all of the physicians of Nanticoke asking a series of questions bearing upon the disease in their midst. From the replies received I find that Nanticoke had been remarkably free from typhoid fever for a long time previous to October of the year just closed. The first case appeared September 27, and the first after that October 4. From that time to December 11, there appeared, as shown by the reports of the

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physicians, forty-nine cases. Dr. Meck also reported having treated a number of "typho-malarial fever," but none that he could call typhoid.

Whenever an epidemic, limited or extended, of typhoid fever occurs we first ask the question, "What water did the patients drink?" and if this seems to be above suspicion the next question that naturally arises in our minds is, "What was the source of their milk supply?"

Of the forty-nine patients reported, seven used well water and forty-two used the public supply taken from Harvey's creek. See Table I. Of the seven who used well water, one contracted the disease away from Nanticoke, one was among the early cases in Nanticoke, and the remaining five, judging from dates of their attack alone, would clearly be classed as secondary cases, due no doubt to contaminated well water. See also, further on in this report. Whence came the infection of the remaining forty-two cases? Why not from drinking polluted water from the public supply? I find upon investigation that Nanticoke, formerly supplied, as villages usually are, by wells, was for a time largely supplied by water pumped directly from the Susquehanna river; but since 1886, the year following the Plymouth epidemic, the supply has been taken from Harvey's creek, the outlet of Harvey's Lake, the largest body of water in the State of Pennsylvania. This stream flows in the main through a sparsely settled country, a large portion of which is mountainous and wild. To-day, in company with Mr. Moseley, superintendent of the water company, and Dr. S. L. Holly, of Nanticoke, I followed the stream five miles up from its mouth toward its source. It is a stream estimated to have an average daily flow of 12,000,000 gallons, and in its present state has evidently much above that figure. The reservoir or intake of the water company is situated about two miles from Nanticoke on the opposite side of the Susquehanna river; and from this point the water is piped to and across the river to the pumping station of the company. Here it enters a receptacle or well twelve feet deep by fifteen in diameter, in such manner as to allow all heavy sediment to settle to the bottom. The overflow from this passes into a second well and a current of several inches from the top of well No. 1, into well No. 2, and on out into the waste water-way carries off any light floating material, such as leaves, sticks, etc., that may possibly have passed through the screens and into the pipes at the reservoir. From the top of well No. 2 the water is pumped through a fine wire screen at the rate of two to two and a half million gallons a day up the hill and into a stand pipe five feet in diameter and fifty-four feet high. From this it is distributed to the town. The arrangements at the pumping station are excellent. A constant stream of running water, abundant in quantity and apparently excellent in quality, is kept passing through the wells before entering the pump. The wells are cleaned, on an average, once a month and any accumulated sediment thoroughly blown out. This, of course, does not necessarily exclude the

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water from being a factor in producing typhoid fever, though it does secure a water supply free from any gross impurities. There are reasons, however, which to my mind exclude the public water supply from a share in causing the present epidemic.

1. I followed the stream for three miles above the reservoir and examined the location of closets, etc., in reference to contamination from cesspool drainage. For a long distance the stream flows through a narrow valley with precipitous wooded hills on either side, and without any houses or chance for the same near its banks. The first house encountered was at Schooley's saw-mill, about a mile above the dam. Here the closet is probably 200 feet from the stream and not in a dangerous location. A half mile further up we found in the neighborhood of Frisbee's mill six or seven houses, but in all but one the closets are at a safe distance from the stream. The exception is located fully forty feet from the stream and is of such a character that no contamination at present need be feared from it. (Its owner promised to use all due diligence to keep it disinfected and offered to move it if we thought it dangerous.)

The next houses encountered were at Ceasetown, three miles above the reservoir. Here there are ten, and at all of them (strange to say) but one, the closets are safely removed from the stream. The exception is at quite a distance from the main stream, but is situated right over a little tributary in such a manner that its refuse is constantly washed away into Harvey's creek. The owner promised to remove it at once. Inquiry showed that there had been no typhoid fever in any of these houses along the stream, nor, as far as could be learned, had there been any cases further up the stream. I did not follow the creek farther than Ceasetown, but learned from the inhabitants that the houses farther up are very few, and in general are situated back from the stream. Inquiry of physicians did not reveal the presence of any cases anywhere along the stream, hence I conclude that in the absence of any positive evidence of contamination we may at least infer that the water was reasonably pure.

2. The large volume of water in the stream at all seasons of the year, and the long distance it flows through sparsely settled country before entering the water company's pipes, would render it a reasonably safe source of supply.

3. I find on the western side of the Susquehanna river, viz: At Avondale, Grand Tunnel and the upper part of West Nanticoke, from one hundred to one hundred and fifty families supplied with water from Harvey's creek, and none of them had typhoid fever during the time of the Nanticoke outbreak.

4. The borough of Nanticoke has from nine to ten thousand people who are supplied with water from Harvey's creek. If the water were at fault we would reasonably expect the cases of fever to appear all over

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the town instead of in a limited portion, and especially would we expect all that portion lying along Main street and still lower toward the river, which would naturally receive water from the dead or less active portions of the water pipes, to be affected equally with that part of the town situated on the hill. Such was not the case.

From the above reasons I think we may reasonably conclude that the public water supply did not cause the typhoid fever of the past few months.

We turn then to the second question and ask: "What was the milk supply of these patients affected with the fever?"

Of the remaining forty-two patients who used hydrant water we find that thirty-one used wholly or in part the milk supplied by a farmer, Mr. T., living three miles above Nanticoke at a place called the Red Tavern, and there is good reason for believing that many others drank also from the same milk. There is situated in the neighborhood where many of the cases occurred a popular drug store where milk shake was dispensed as a popular beverage, and the milk for the same was furnished by Mr. T. Several of the retailers were in the habit of purchasing milk from the same farm for a portion of their supply.

I send you herewith a tabulated list of all of the cases reported to me thus far from Nanticoke.

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TABLE I.—TABULATED LIST OF TYPHOID FEVER PATIENTS IN NANTICOKE, PA., 1891.

Number.	NAME.	By whom reported.	Age.	Sex.	Residence.	Date of attack.	Result.	What water supply.	What milk supply.	Disinfection.	Disposal of excreta.	Sanitary surroundings.	
		Doctor.											
1	George G.,	Sutliff,	10	M.	144 E. Broad,	Oct. 2.	Recov.,	Hyd'nt,	Badman,	Carbolic acid,	Buried,	Good.	
2	Mrs. John V.,	Mahon,	35	F.	Greene and Walnut,	Sept. 27.	Died,	do.	Badman and Turner.	Bromo-chloroline,	Privy,	Bad,	
3	Harry C.,	Davis,	20	M.	Noble street,	Oct. 4.	Recov.,	do.	.....	Chloride of lime,	do.	Fair.	Diseas cont. at Winton, Pa.
4	Wm. M.,	Davis,	20	do.	Church street,	Oct. 4.	do.	do.	Odgers,	Chloride of lime,	do.	do.	
5	Ivor. R.,	Davis,	15	do.	Greene street,	Oct. 10.	do.	do.	Own cow,	Chloride of lime,	do.	do.	
6	Jonathan G.,	Davis,	15	do.	Greene street,	Oct. 10.	do.	do.	Turner,	Chloride of lime,	do.	do.	
7	Grant M.,	Hill,	8	do.	Prospect street,	Oct. 11.	do.	do.	Turner,	Lime-sulph. iron,	Buried,	Good.	
8	Polish girl,	Hill,	14	F.	Greene street,	Oct. 11.	do.	do.	?	do.	do.	do.	
9	Edw. R.,	Sutliff,	17	M.	E. State street,	Oct. 12.	do.	do.	Turner,	Carbolic acid,	do.	do.	
10	John V.,	Mahon,	35	do.	Greene and Walnut,	Oct.	do.	do.	Turner,	Brom. chlor.,	Privy,	Bad.	
11	Edward C.,	Mahon,	17	do.	Church & Hanover,	Oct. 12.	do.	Well,	Turner,	None,	do.	do.	
12	Jennie McG.,	Mahon,	14	F.	Greene and Walnut,	Oct. 13.	do.	Hyd.,	Metzger,	do.	do.	do.	Milk occas. from Turner.
13	Chris. E.,	Hill,	24	M.	Church street,	Oct. 13.	do.	do.	Wolfe,	Lime FeSulp.,	Buried,	Good,	Drank Turner's milk also.
14	Elmer B.,	Hill,	14	do.	Greene street,	Oct. 14.	do.	do.	Jenkins,	do.	do.	do.	Drank Turner's milk also.
15	Mrs. Lottie F.,	Kingsbury,	21	F.	E. State street,	Oct. 14.	Died,	do.	Turner,	Sulph. iron,	Buried or closet.	do.	
16	John F.,	Mahon,	36	M.	Broad street,	Oct. 14.	Recov.,	do.	Condensed M.	Brom. chlor.,	Privy,	Bad.	
17	John V., Jr.,	Mahon,	8	do.	Greene and Walnut,	Oct. 15.	do.	do.	Turner,	do.	do.	do.	
18	John H. C.,	Davis,	40	do.	Noble street,	Oct. 17.	do.	do.	Smith,	Chlor. lime,	do.	Good.	Father of No. 3.
19	James A.,	Kingsbury,	51	do.	West Maine,	Oct 25.	Died,	Well,	Own cow,	Sulph. iron,	Buried,	do.	Cont. disease at Winton, Pa.
20	Mrs. Jas. G.,	Mahon,	33	F.	Broad and Walnut,	Oct. 26.	Recov.,	Hyd.,	Turner and Elsurton.	None,	Buried,	Bad,	Milk part of time from Turner.
21	Mrs. Geo. G.,	Sutliff,	20	do.	E. State street,	Nov. 2.	Died,	do.	Turner and Badman.	Carbolic acid,	do.	Good.	
22	Levi M.,	Mahon,	2	M.	Church & Hanover,	Nov. 7.	do.	Well,	Own cow,	Brom. chlor.,	do.	Bad.	See report.
23	Mrs. Annie W.,	Kingsbury,	19	F.	E. State street,	Nov. 5.	.....	Hyd.,	Turner.	Sulph. iron,	Privy,	Good.	Metzger's milk also.
24	Annie McK.,	Mahon,	23	do.	Greene and Walnut,	Nov. 9.	Recov.,	do.	Turner occasionly.	Brom. chlor.,	Closet,	Bad.	
25	Mrs. Albert D.,	Sutliff,	22	do.	E. State street,	Nov. 8.	Died,	do.	Turner and Badman.	Carbolic acid,	Buried,	Good.	

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26	Boleslow G.,	Davis,	33	M.	Honey Pot.	Nov. 15,	Recov.,	Well,	Neighbor,	Chloride lime,	Buried,	Fair,	
27	Sarah W.,	Davis,	12	F.		Nov. 15,	do.	Hyd.,	Own cow,	do.	Privy,	do.	Niece of No. 18, & vis the farm freq. dur. illness. Suppplied in part by Turner.
28	Mrs. John M.,	Mahon,	30	do.	Maine street.	Nov. 15,	do.	do.	Dietrick,	Brom. chlor.,	do.	Good.	
29	Bennie M.,	Hill,	6	M.	Church,	Nov. 27,	do.	Well.	Own cow.	None,	do.	do.	
30	Mrs. M.,	Hill,	30	F.	Church,	Nov. 30,	do.	do.	Own cow,	Brom. chlor.,	Buried.	do.	
31	A. M.,	Hill,	4	M.	Church,	Dec. 2,	do.	do.	Own cow,	do.	do.	do.	
32	George G.,	Hill,	24	do.	State.	Nov. 30,	Conval.,	Hyd.,	Turner,	do.	do.	do.	
33	Mrs. Ella B.,	Kingsbury,	20	F.	Broad street,	Nov. 28,	do.	do.	Turner,	Sulph. iron,	do.	do.	
34	V. R.,	Davis,	6	M.	Market.	Dec. 1,	Recov.,	do.	Neighbor,	Chloride lime,	do.	Fair.	
35	Charlie S.,	Kingsbury,	17	do.	Prospect.	Dec. 1,	Conval.,	do.	Turner,	Sulph. iron,	Privy,	Good.	
36	Polish child,	Hill,	2	do.	Green,	Dec. 2,	Recov.,	do.	?	Lime, etc.,	do.	do.	
37	Albert H.,	Kingsbury,	25	do.	R. R. street.	Dec. 6,	Conval.,	do.	Turner,	Sulph. iron.	do.	do.	
38	Mrs. Mary C.,	Kingsbury,	51	F.	Green street,	Dec. 8,	do.	do.	Turner,	do.	do.	do.	
39	Mrs. Anton K.,	Kingsbnry,	32	do.	Green street.	Dec. 8.	do.	do.	Neighbor,	do.	do.	do.	
40	Lizzie D.,	Davis,	6	do.	State street,	Dec. 8,	Recov.,	do.	Turner,	Chloride lime,	do.	Fair.	
41	Mrs. Geo. L.,	Holly,	31	do.	State street,	Dec. 11,	Conval.,	do.	Badman,	Lime,	do.	Good.	
42	George B.,	Dodson,	20	M.		Sin. Oct. 1,	Recov.,	do.	Turner,	Chloride lime,	Buried,	do.	
43	Stephen H.,	Dodson,	20	do.		do.	Died,	do.	Turner,	do.	Burnt or thrown in closet	do.	
44	Fred. H.,	Dodson,	2	do.		do.	Recov.,	do.	Turner,	do.	do.	do.	
45	George B.,	Dodson,	17	do.		do.	do.	do.	Turner,	do.	do.	do.	
46	Mrs. Frank G.,	Dodson,	19	F.		do.	Died,	do.	Turner,	do.	do.	do.	
47	Mrs. Annet D.,	Dodson,	28	do.		do.	Recov.,	do.	Turner,	do.	do.	do.	
48	Lizzie J.,	Dodson,	13	do.		do.	Died,	do.	Turner,	do.	do.	do.	
49	Mr. ——,	Dodson,		M.		do.	Recov.,	do.	Turner,	do.	do.	do.	

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In analyzing these cases as tabulated we find first of all that Nos. 3 and 19 contracted the fever at Winton, Pa., and came home to Nanticoke sick with the disease. Hence in a consideration of the causes of the epidemic in Nanticoke these two should be ruled out of the list.

No. 18 was father of one of these cases and came down with the fever thirteen days after his son began. He might possibly be classed among the secondary cases from carelessness in management, though the physician had instructed the family to use chloride of lime as disinfectant.

No. 27 was a niece of this family and frequently visited them during their illness. If the above four be omitted we have left forty-five cases to be considered; of these twenty-seven were supplied with T.'s milk directly.

Of the remaining eighteen, Nos. 12, 13 and 14 drank milk also occasionally from T.'s.

Two Polish children, Nos. 8 and 36, are reported as source of milk supply unknown. It is difficult for the physician to ascertain all of the facts from some of the foreign population who do not speak English.

This leaves twelve who are reported as having milk from their own cows, from neighbors, or from dealers other than Mr. T. Of these six used well water instead of the public supply, and four of them are cases in which the origin of the infection may be clearly traced.

C. (No. 11) was clerk in a drug store where milk was used freely as a beverage. He drank of this milk which was supplied by T. and was taken with fever Oct. 12. He lived with his sister in whose family Nos. 22, 29, 30 and 31 were attacked respectively Nov. 7, Nov. 27, Nov. 30 and Dec. 2. Clearly cases of secondary infection from infected well water from the introduction into the house of case No. 11. The physician in attendance says the water was gotten from an old well 5 or 6 feet deep just back of the house, and in a location to catch all the drainage from the surface under and around the house. In this case excreta were thrown on the surface and in privy vault, and no disinfectant was used until the patient had been ill for some days. If these four should be regarded as secondarily, due to T.'s milk, it would make thirty-seven out of forty-five cases or 82 per cent. probably due directly or indirectly to T.'s milk.

As to the remaining eight cases, who are reported as procuring milk of different dealers, it can by no means be asserted that they did not drink of T.'s milk, for many people were in the habit of drinking milk at the drug store above mentioned. An interesting incident is found in the family of Dr. D. who procured his milk from a different dealer. In the hot summer and autumn evenings he frequently went over to a local retailer and purchased a quart of milk. This was drank before going to bed. His wife was taken ill with typhoid, and his mother-in-law, who was staying with them for a time, was also taken ill, went to her home in another town and died of typhoid fever. Inquiry revealed

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the fact that the milk used came from the T. farm. While it is impossible to say with absolute certainty that the epidemic was caused by milk supplied from the Red Tavern farm, yet the fact that so large a portion of the cases used this milk is sufficient to cast some suspicion upon the milk supply. An investigation at the Red Tavern showed five cases of Typhoid fever in the T. family, with three cases of probably the same in another family living under the same roof. See my report of Jan. 1, '92 on the Red Tavern investigation.

Mr. T. supplied about sixty families with milk, but since the popular opinion has been so strongly expressed against his milk he has discontinued his milk route. The opinions of the local physicians with whom I have conversed, is, that the outbreak of typhoid fever in the borough was caused by infected milk. I quote from a letter of Dr. D. H. Davis, under date of Jan. 7:

"With the exception of G. all these cases occurred in the southern or hill portion of the town where the sanitary conditions are as good as possible consistent with the absence of sewers. It is the opinion of the local physicians, myself included, that the epidemic is largely due to the milk supplied by Mr. T. While an analysis of my own cases will not justify such an assumption, the history of the aggregate of the cases with reference to this point will, I think do so. Furthermore it is known that T. has furnished other dealers with milk from his own supply. Among the first cases which occurred in town were those of two boys, R. and B., who were employed in a cigar store beneath my office, and whom I almost saw daily go to T.'s wagon and drink their fill of milk. They were attacked almost simultaneously with the appearance of the disease in T.'s own family. I did not attend any cases of typhoid fever the past summer previous to October 1, and six cases will include all the instances in which I have treated the disease or known of its existence in the town since the introduction of the public water supply (probably six years), prior to the first of October. I know of but one case having occurred in Grand Tunnel, a boy who had been abroad previous to his attack. This fact I think militates against the assumption that the water supply was responsible for the appearance of the disease."

Inquiry of physicians and others showed that while the borough is by no means in an ideal sanitary state, yet its general sanitary condition is as good as can be expected without sewers, and was as good in the year just passed as in previous years. I have not as yet investigated the ice supply. In the absence of any other discovered possible cause, in presence of the fact that typhoid fever was very prevalent in the T. family, and that it appeared in so many of the families of his customers, I think his well should be condemned; that he should be ordered to discontinue the use of this water for drinking purposes and for washing his milk cans unless it be previously boiled.

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3. INSPECTION AT ARDMORE, MONTGOMERY COUNTY.

(a) COMPLAINT.

By Dr. E. C. TOWN, *Special Medical Inspector Pennsylvania Railroad.*

PHILADELPHIA, *December 28, 1891.*

Complaint has reached me from some of our employees living in Ardmore, Pa., of the unsanitary and dangerous conditions existing in that village. Scarlet fever is endemic and some of the families in which it exists are allowed to mingle indiscriminately with the populace. Particular mention has been made of the family of J. R. living on Sibley avenue, in Ardmore, in which two deaths have already occurred and one or more are sick with the disease. The sanitary condition of the premises in which these people live, is a disgrace to the community, no water closet or privy-well exists, as I am informed and the exterior as well as the interior of the house is in a filthy condition. May I hope in the interest of this road something may be done to protect our people.

(b) INSPECTION.

By WM. B. ATKINSON, M. D., *Medical Inspector.*

SUBJECT OF COMPLAINT, THE PREVALENCE OF SCARLET FEVER.

PHILADELPHIA, *December 30, 1891.*

I visited and carefully inspected the premises of J. R., on Sibley avenue. The disease had prevailed in this house in a malignant form, accompanied (according to the statement of the mother) by diphtheria. The family consisted of father, mother, and four children. The youngest was four weeks old and had a mild attack of the disease, from which it is now recovering, the efflorescence now going on. Two children aged three years and seventeen months respectively, died of their attack about a week ago. The others were not apparently affected. The mother at the time of my visit was suffering with sore throat. I found the cellar wet and a few apples were rotting on the floor. I was assured that no vegetables or anything else had been in the cellar. The house in every way showed want of care, but as the mother had just been confined, and she said she had a poor nurse, this was not surprising. Chloride of lime was spread on a table in the front room and the physician had suggested disinfection. I urged a removal or that the cellar be made dry, the house thoroughly cleaned and disinfected. She assured me that this should be done, or she and the children would be removed at once. The scarlet fever notice was left to be posted.

Careful inquiry among the people and physicians only showed one other case of recent illness, that was a child named Gallagher aged six

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years, who died six weeks ago and a public funeral was held at the church of St. Dennis. This case was on the Lancaster pike at some distance away.

One family on Sibley avenue, consisting of nine children from thirteen years to six weeks, and the parents had the disease but in a mild form, three only, being sick, and here every precaution was taken both by the family and the physician, isolation, disinfection, etc.

I would recommend that the family of J. R. be supplied with circulars on the disease and disinfection, and that Mr. R. be required to put his house in a proper condition whether his family are removed or not. That the clergy, etc., of St. Dennis be notified of the risk incident to their action, and that the scarlet fever circulars be sent to the physicians of Ardmore, Drs. Allison, Arnold and Gerhard. The former had charge of the family who were so well cared for and perhaps is supplied. Also send to Mr. Harry Orr, freight agent at Ardmore, who expressed a desire to have them for distribution.

(*b*) LETTER TO J. R. FROM THE SECRETARY.

January 30, 1892.

Mr. J. R., *Sibley avenue, Ardmore, Montgomery county, Pa.:*

DEAR SIR: It has been reported to me that the instructions left at your house with regard to the cleaning up of your premises have not been attended to, also that there is another case of scarlet fever in your family.

You understand that so long as the disease exists, and until the house has been cleaned and fumigated, your children must not visit any other house, nor must friends be allowed to visit unnecessarily at your own house. I have sent you a circular containing full instructions for the use of disinfectants. Chloride of lime is cheap, and to be obtained at any grocery, and there is no excuse for not using it. If you do not understand the directions of the circular get your family physician to explain them to you. I understand that there is no proper privy on your place. The best thing for you to do will be to have two tin or iron buckets to put under the seat and keep a box of coal ashes in the privy and throw a small shovelful into the bucket every time it is used. When one bucket is full it should be taken to a distance and its contents buried in some field or wood and the other put in its place.

The penalty for disobedience of the orders of the State Board of Health is one hundred dollars ($100.00). I shall make further inquiries as to whether you are complying with my instructions.

Yours very truly,

BENJAMIN LEE,
Secretary.

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4.—INSPECTION AT PHILIPSBURG, CLEARFIELD COUNTY.

By C. B. DUDLEY, M. D., *Medical Inspector.*

ALTOONA, *January 29, 1892.*

I visited Philipsburg yesterday and consulted with Dr. S. F. Lytle and Dr. J. D. McGirk and also saw Dr. Buckingham and Dr. Dinwiddie. I also went to the places where the spotted fever has been and still is. I found as follows:

There have been five fatal cases and there are still five cases of spotted fever under treatment, with the possible doubt in one or two cases of those now sick as to whether the case is spotted fever or not. The cases are not confined to any locality and are spread over a radius of two and a half miles from the center of the village, some being at one extremity and some at the other. Some of the cases happened right in the village. I was at three of the places where the fever has been and still is and was really unable to discover anything which would throw any light on the cause. The surroundings were in no case more unsanitary than it is customary to find among the mining population, and in some of the cases there was less unsanitary condition than you would expect. At one place where two have already died and a third is still sick, the cellar was thoroughly well ventilated, although wet and cold. The water was the hydrant water, which is used all over the village and is brought in from a distance, and is claimed to be in every sense a magnificent water. The slops were fairly well disposed of by surface drain and there was really nothing to indicate unsanitary conditions, except possibly a little lack of house ventilation. You will understand that everything being frozen, it would be impossible to locate any unsanitary condition by odor, but I think it is fair to say that there is nothing in the local surroundings which could fairly be regarded as causing the trouble. I do not think the condition of Philipsburg is such as to threaten the public health. The village is pretty well cleaned, has good streets, some sewerage and a public water supply. There are about 4,000 people in the village, with outlying mining settlements of 50 to 100 families surrounding in distance of one to three miles from the place.

I found the physicians a little in doubt both about treatment and about causes for the disease. Both Dr. Lytle and Dr. McGirk impressed me as careful and able men and both said frankly that they did not seem to be able to get hold of enough information to enable them either to trace the origin of the disease or to know how to successfully combat it. Dr. Dinwiddie had three cases, all of which proved fatal.

The most that I think can be done in the matter is for you to send to Dr. Lytle or McGirk any information which you may have as to the etiology or treatment of the disease. I should also like very much if you could send me anything in print, or let me know where I can get

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anything in print, on the relation between this disease and unsanitary conditions. I was quite at a loss to suggest anything to the physicians and could only say that I would write you fully and ask you to send all the help that you could.

In reference to the request for information as to the etiology of the disease, the Secretary addressed a note to Prof. L. A. Sayre, of New York, who had investigated a similar epidemic some years ago and Dr. Sayre replied as follows:

(*b*)—CEREBRO-SPINAL FEVER, BY LEWIS A. SAYRE, M. D., NEW YORK.

February 12, 1892.

MY DEAR DR. LEE: I am very sorry that I can find no copies of my reports on the "Epidemic of Malignant Spinal Meningitis," as it was called when it prevailed at Long Branch, some years since.

It produced such a panic in the city that the long shoremen at the docks would not let the sloops from Jersey shore land, and we were threatened with a loss of our Jersey marketing. I was then resident physician of the city and was sent to Long Branch to investigate the subject.

It was intensly cold and the snow quite deep, which was unusual for Long Branch, and all the old fishermen caulked their windows, and every crack where air could enter, and heated the rooms with large iron stoves.

They lighted them with lamps filled with kerosene oil, and when at full blaze the combustion was perfect and not dangerous, but when turned down low, as was the custom on retiring, the combustion was very imperfect. The chimney would become blackened and the room filled with black, floating carbon, which being inhaled caused death. At the same time they were drinking a coffee manufactured from fermented flour and chickory, and eating bread made of "Smutt Rye"

Discovering the cause of illness, I immediately removed the cotton packing from all the cracks, and thus allowed air into the house; compelled them to extinguish the lamp entirely, or else burn it at full combustion. Threw their coffee into the street, and compelled them to stop using the diseased flour, and the disease immediately abated and never returned.

Only three deaths occurred of spinal meningitis after my visit, although over ninety had died in one week in the little village of Long Branch alone.

I think this occurred in the winter of 1855-56, and if you can refer to any of the daily papers of that date you will find quite full descriptions by me on the subject.

I wish you would come down some time and talk over the matter for it is very important, and I cannot find time to write you fully about it.

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5.—INSPECTION AT BRISTOL, BUCKS COUNTY.

By W. B. ATKINSON, M. D., *Medical Inspector.*

PHILADELPHIA, *February 19, 1892.*

Complaint.—Supposed case of typhus fever in a newly arrived immigrant.

Visited Bristol to-day by an early train. I met Mr. G. L. Horn, Chairman of the Sanitary Committee, who informed me that he had just found who was the attending physician of the man, Dr. J. D. Abbott, and he had assured Mr. Horn that this man was not sick. In company with Dr. Abbott I went to the residence of the case and found him perfectly well, walking about, and was informed that he had, save a slight indigestion the first day after his arrival at Bristol, had no sickness whatever. His name is Francesco Marino, age 42 years, had not been in company of any of the affected people, and that it was now eighteen days since he arrived in Bristol.

Mr. Horn had been notified by a countryman of this immigrant that he was sick, and knowing that he was one of those on the infected vessel, he had deemed it best, in the absence of any information as to who was the medical attendant, to place a guard on the place, and to notify the State Board of Health. The burgess had at once ordered the police to notify all the physicians and druggists in Bristol to inform him immediately of any suspected cases among any new arrivals. Thus everything was done to prevent any spread from such a center. This morning Dr. Abbott had informed the authorities of the true state of the case and the guard was withdrawn. Dr. Abbott having seen cases of typhus at Naples, knows the disease and is fully ready to co-operate in all measures for the public health.

I commended the authorities for their prompt action while doubt existed as to the presence of this alarming form of disease.

Though this man has now been nineteen days away from the infection, yet I deemed it best to urge that he be kept under surveillance for some time longer. The premises were in a proper sanitary condition.

6.—INSPECTION AT LANSDOWNE, DELAWARE COUNTY.

By W. B. ATKINSON, M. D., *Medical Inspector.*

March 21, 1892.

SIR: I have the honor to report that in compliance with instructions received from you March 18, 1892, I visited Lansdowne on March 21 and found the following conditions to exist:

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Mr. H. S acknowledged having pumped the contents of his well out into the gutter, whence it flowed past a number of dwellings into the Darby Creek. He condoned his action by showing your inspector several instances where the flow of cesspool filth is going on daily by overflow by pipes for the purpose, etc. It appears that, say one-third of the houses drain out into the gutters, one-third have covered pits which are pumped out when full and emptied at the most convenient point, one-third have pipes conveying the filth to the creek. In many instances the pipes are imperfect or open, or not carried to the creek. Taking it all together the sewerage and drainage of the place needs a thorough change, and to do this it would be well for the inhabitants to unite and obtain some form of village government by which to enforce laws for the care of their health and protection from the neglect or direct carelessness of their neighbors who thus trifle with the laws of sanitation.

7.—INSPECTION AT OGONTZ, MONTGOMERY COUNTY.

By WM. B. ATKINSON, *Medical Inspector.*

On account of Deaths from Diphtheria.

April 14, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Ogontz on April 13 and found the following conditions to exist:

The toll house next to the house in which were the fatal cases was in a very insanitary condition in every respect. This house is entirely unfit for a habitation and should be torn down. Its cesspool was only a shed with a seat, and all the filth was deposited on the surface of the ground with a trend towards the drinking well which was distant but some ten feet. I was assured that this, now full to the seat, should be cleaned at once. There had been no sickness in this house of any kind.

Next to it was the house in which had occurred four fatal cases of diphtheria, and from it were taken two other children who recovered rapidly after their removal to a perfectly clean house at a distance. The lower story of this house showed evidence of great want of cleanliness on the part of the man who had occupied it. The next house closely adjoining it appeared in a much better condition. Both had been thoroughly disinfected. Both had remained without occupants since the deaths had occurred in the other house. The drinking water of both these houses did not evince any cause for the illness that had occurred.

The toll house below was in a fair condition though the cesspool and the drinking well were within some ten or twelve feet of each other.

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Much want of care was seen here and a great need of sanitary reform. In the rear of this house was the ice dam or pond, the dam no longer existing. The place was a swamp liable to overflow and cause malarial trouble if nothing else. This should be drained. It belongs to Mr. C. R., of Edge Hill, Montgomery county. A straight cut through from the point of inflow to the outlet would drain this place and prevent further trouble.

I would urge the removal of the toll house at the upper point—the houses where the cases were and the thorough removal of the filthy soil, disinfection and refilling with fresh earth. I found the owner (Mr. A. J. E.) of the two houses was willing to do this with these houses. The toll house belongs to the pike company, who should be required to remove it and thoroughly clean the ground upon which it stands. The other toll house should be cleansed, its cesspool placed a proper distance away from the house and the drinking well.

Respectfully submitted.

8.—INSPECTION AT PENNSYLVANIA MILITARY ACADEMY.

By WM. B. ATKINSON, *Medical Inspector.*

On account of Typhoid Fever of a Virulent Form.

April 30, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Pennsylvania Military Academy on April 23 and found the following conditions to exist:

I was joined by Surgeon J. S. Billings, United States Army, and Dr. Abbett, his assistant, and with these gentlemen made a thorough inspection of the entire building and premises. This includes both the milk and water supply. We found absolutely nothing amiss in any part of the building or its surroundings. Samples of the drinking water, scrapings of the tank and of the filter were taken by Dr. Abbett for thorough examination. I believe that I voice the belief of my colleagues in this inspection when I say that we regard the outbreak as having originated without the walls of the institution. Inasmuch as the fever is prevailing in several parts of Chester and the surrounding villages, I feel sure that in some way those attacked received their infection from some place visited during absence from the Academy. The milk supply being from the cows of the institution and used by all who desired it, and particularly by a number who were not affected, could not be regarded as a cause.

I do not think that I can too strongly commend the excellent condition in which we found every part of the institution.

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In this connection I must say that the city of Chester needs much improvement as to its water supply and drainage. The water is wholly from the Delaware, and is believed to acquire additional pollution near the city.

9.—INSPECTION AT NEW HOPE, BUCKS COUNTY.

By WM. B. ATKINSON, *Medical Inspector.*

On account of Typhoid Fever at house of Mr. E., near that place.

April 26

To the Secretary of the State Board of Health:

SIR: I have the honor to report that in compliance with instructions received from you I visited New Hope on April 26 and found the following conditions to exist:

The entire family of W. E., consisting of self, wife, child, sister of wife who came to act as nurse, and the hired man, had a mild form of fever of a continued type pronounced typhoid by Dr. Walter—all recovered after several weeks illness. The house is away from any others, with good surroundings and apparently nothing to cause disease. But the well which received the drainage from the roofs and surface just before the outbreak of illness burst its bounds and emptied its contents into the well of drinking water but a few feet away. This water was analysed by Dr. Leffmann and pronounced unfit for use. This water was at once avoided and water obtained from a neighbor. The well was cleansed, a new pump placed in it and the cistern disconnected so that no drainage could flow into it. I feel sure that the water is now in good condition.

The cesspool was only a house on the back part of the place, no vault, but the dejections were directly on the ground. I urged that an earth closet should take its place. The well which received all the house drainage and sewage was in the rear of the house, nearly full of excrement, had no cement, being merely a dry wall well. This I urged should be cleansed, cemented and thoroughly disinfected. The trend of the rock appeared to be from the drinking well, and there did not appear to be any evidence that either of the cesspools had aided in producing the disease. All my suggestions were agreed to and I do not apprehend any return of disease.

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10.—INSPECTION AT DEVON AND BERWYN.

By WM. B. ATKINSON, *Medical Inspector*, on account of Pollution of Neighboring Waters by the Sewage of the Devon Inn and Properties.

April 29, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Devon, etc., on April 19th, and found the following conditions to exist:

The line of pipe had been carried a short distance below its former outlet, as if to clear the entrance to the creek by Mr. E.

The old drains were almost in the same condition as before, save that part of them had the cap stones removed and the bed partly filled with earth. As the side walls still remained, more or less of the old drainage continued. No cleaning had been done of the sludge, which for a long time has been accumulating in the pits on the line of these old drains. No filtering beds had been put in as proposed, the only real change for the better was that one reservoir had been cemented; but I saw at one place where a brick had been removed, and the sludge allowed to flow as before over the ground, and thus to continue the washing down into the creek below. I saw one or more piles of sludge that had been brought from the cottages and dumped on the surface; in fact I can really give no credit for any real honest effort to remove the water pollution.

In addition, my inspection revealed other objectionable features near the hotel in the form of open wells, each quite full, covered with earth, which must constantly leak their foul contents into the neighboring soil and waters, and are a constant menace to two cottages near at hand.

The water supply of the hotel is doubtful, both as to its source and its purity. With regret I am compelled to renew my condemnation of this entire place.

11.—INSPECTION AT COUDERSPORT, BUTLER COUNTY, PA.

By J. R. THOMPSON, M. D., *Medical Inspector*, on account of Outbreak of Smallpox.

July 1, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I reached Coudersport on June 24, 1892, and found the following conditions to exist:

Population, about 3,000; incorporated; burgess, C. H. Armstrong; drainage, good; water supply from large spring, conducted by pipes.

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No special diseases prevailing at present outside the above. Diagnosis verified by the three oldest physicians of the town, Dr. Ellison, Dr. Frank Buck, Dr. E. H. Asher and myself. Number of cases, six (6); began about a month ago; type, "Discrete;" precaution, have already isolated and quarantined. Issued orders because I did not hear from you to the contrary.

12—INSPECTION AT BIRDSBORO, BERKS COUNTY.

By W. H. BOARDMAN, *Engineer Inspector*, on account of Pollution of Public Water Supply.

PHILADELPHIA, *July 20, 1892.*

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Birdsboro on July 20, 1892, and found the following conditions to exist:

The supply of water, which I found to be at present much better than it has been for some time, is obtained from several small streams formed by the numerous springs on the hillsides and impounded in a large reservoir formed by an earthen dam built across the ravine.

The dam is excellently located and well designed; the reservoir thus formed affords an abundant supply of water by gravity to the inhabitants of Birdsboro and the adjacent towns.

The nuisance complained of is caused by a large number of old stumps, roots, muck and other debris in the bottom of the reservoir, and by the building of a brick wall laid in cement mortar across the spillway. The safety of the dam has been much endangered, and the water forced out of its original limits back into the surrounding woods; also the absence of a fence around the reservoir allows cattle to contaminate the water. In order to protect the water from pollution and the dam from serious damage I recommend:

That the brick wall and all other obstacles in the spillway be entirely removed so that nothing will prevent the waste water from escaping without overflowing the breast of the dam.

All the land that is covered by water when the dam is full should be entirely cleared of all stumps, roots, sods or other perishable material, the same to be either burned or removed to a point below the dam.

That in connection with the present supply pipe a branch pipe be provided extending upward to a height of about five feet above the present pipe and inside the screen chamber, this pipe to be used as the regular supply pipe, the present pipe to be used only when the water is below the top of the other pipe, or when it is desired to draw off the water from the dam.

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A good substantial fence should be built entirely around the reservoir.

The fire hydrants on all dead ends of the distribution pipes should be opened frequently to clean out the pipes.

It is also recommended that an engineer experienced in this kind of work be employed to supervise the repairs to the dam, as such work must be very carefully done, and the work should be performed only by experienced men.

If this reservoir is properly cared for there is no doubt that the inhabitants of Birdsboro will obtain a bountiful supply of good, wholesome water, as I have examined the water-shed and found no source of pollution.

13.—INSPECTION AT NORWOOD, DELAWARE COUNTY.

By WILLIAM B. ATKINSON, *Medical Inspector*, on account of complaint of drainage standing in gutter.

August 10, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Norwood, on this day, and found the following conditions to exist: The entire drainage of one or more houses flows into the road gutter, and as there is no means of exit, it remains and stagnates in front of the door of the complainant. These people have provided for the drainage from their own premises by means of a sewer pipe running beneath their premises to a rear street, thence into the road gutter. As their premises are located at a distance from the next cross street any gutter continued from their house on the road would require a further expense to carry the drainage into the cross roads on property known as a public park. Therefore they claim that the houses from which the drainage issues should be provided with a pipe on the premises similar to that on their own. This can easily be laid and will obviate all cause of complaint. This is the only proper plan which should be adopted, and I would recommend that this be urged upon the owner of the property in fault.

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14. INSPECTION AT CHADD'S FORD, ETC.

By WM. B. ATKINSON, *Medical Inspector*, on account of Diphtheria in a malignant form.

August 5, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Chadd's Ford on August 5, and found the following conditions to exist:

The population of this town is about one hundred and fifty. It has no organization. It is located on a flat piece of ground with a substra-

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tratum of clay. This is say three feet below the arable soil, and extends about six to eight feet to a porous water bearing gravel. All the drainage is on the surface save in one instance. The water supply is abundant but in many cases it has been decided to be non-potable. At least two householders, one the hotel have provided good water from an artesian well with a windmill to pump it into the reservoir. There has been very little sickness until June 26, when a child of Dr. Heyward was attacked with diphtheria and died in four days. An interval of eighteen days occurred, and a third case occurred at a short distance and to the rear of the others. Death ensued in about four days. On the 2d of July a child of the next neighbor was attacked and died in four days. On July 29 the fourth case occurred and died suddenly when apparently convalescent on the 3d of August. Two other cases of mild sore throat occurred and during my visit I saw a colored woman with an ulcerated throat. The first three cases were children under ten years, all appeared malignant from the outset. The fourth was a man about twenty-five years. His death appeared due to the passage of detached tissue into the air passage, producing asphyxia almost immediately. The circulation continued for an appreciable time after breathing had ceased. After a very careful inspection of the infected houses, I found that every precaution had been taken to disinfect the premises, the other children were removed, and efforts made to prevent further attacks.

A singular feature that but one in a household with a number of others only should be attacked and in such a malignant form.

The drainage is poor owing to the flat condition of the surface, and the water has been condemned in several instances. As one house connects its cess pool, etc., with an abandoned well, it is extremely probable that this pollutes all the underlying water basin, this rising after a heavy rainfall in at least two houses, comes into the cellar, and it is reasonable to believe that the air of these places is rendered dangerous. I found a large collection of recent oyster shells which had been allowed to putrefy in the hot sun.

Every one who met me expressed a willingness to do what they could to prevent a continuance of the disease.

The remedy is that all drains be frequently flushed and kept in good condition. The oyster shells to be removed. This was promised me by the owner of the place. The cellars to be made tight and where any evidence of a leak is shown, that must be stopped. The connection of the hotel with the old well must be removed.

With these precautions, I think there will not be any more cases of the disease, and perhaps a typhoid epidemic may also be prevented. After the abandonment of the water pollution, every one, particularly those near to the hotel, should pump out their wells thoroughly in order to secure pure water.

I enclose a map furnished me by Dr. Johns.

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15.—INSPECTION AT NORRISTOWN, MONTGOMERY COUNTY.

By W. B. ATKINSON, M. D., *Medical Inspector.*

PHILADELPHIA, *August* 3, 1892.

Subjects of complaint.—An establishment for boiling refuse, fat, grinding bones, etc.

2. Condition of fish market belonging to the borough.

3. Condition of bridge belonging to the borough.

4. Collection of drainage on an unopened street.

In the case of the boiling establishment of J. S. Long, on visiting the stores and residences on Main street to the north of this place, each person assured me that when in full operation, and the wind in the direction, the odor was such as to sicken everyone, to compel the closing of windows, and in short to cause all who could get out of the range of the smell to do so quickly. I was promised a list of the names of those so annoyed, but I may mention the proprietor of the Hartranft House on Main street, Dr. Eisenberg, whose office is adjoining; an ice cream saloon, etc. All assured me of the sickening odor and a loss of business owing to the unwillingness of customers to encounter this horrible stench.

I went to the place and found that owing to an accident to the boiler the works were just starting up. Mr. Long acknowledged that as he had not expected a visitor, his place was not as clean as he would have had it. There was a quantity of rotten fat in the press which was full of maggots and giving forth a horrible stench. When in full blast it is impossible for such a place to be otherwise than highly objectionable, and although the proprietor was using the best kind of boilers, yet he cannot prevent the odor from escaping in every direction. Such a place should not be permitted in the built up portion of any inhabited place. I would recommend its removal.

2. The fish market is about as well kept as such places can be. It should have been located at the other end of the market for convenience of pouring the drainage directly into the sewer. Where it is requires all the foul matter to flow the whole length of the street to reach the inlet. The lower wood work is rotten, the foul drainage soaks into the places beneath and there continues to putrify and add to the nuisance.

The remedy is to remove the fish market to the other end, or to build the sewer up to reach it. If the latter, the old rotten wood must be torn away, the places beneath disinfected and the nuisance will be relieved for a time.

3. The bridge is filthy. It is covered, and boarded in, so that the wind and rain cannot act to aid in keeping it clean. I was informed that no sprinkling is done when it is swept, what dirt (largely drop-

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pings of horses) is gathered, is placed in open barrels on each side of the driveway, and there it remains weeks at a time. I saw at least 50 full barrels, with many others part full. Beneath the walk in the center the sweeping appears to be done very imperfectly. Every ledge and crevice is loaded with this dirt, to be blown about by what air passes through, and all who use the bridge must take with them a liberal supply in their lungs, clothes, etc.

The remedy is thorough and frequent cleansing, first sprinkling the place, then the immediate removal of the sweepings.

It would aid greatly in keeping this bridge clean if the roof and sidings were removed, leaving the bridge itself free to the rain and winds.

4. Drainage on the unopened street, while not much of a nuisance yet, must accumulate and form a foul place, and if more houses are erected in its neighborhood will become a disease breeder.

The remedy is to require a drain to be carried through to permit the flow to pass off.

In conclusion, I would urge that the above remedies be applied. The first, by the owner of the boiling establishment. In the other two instances, the borough itself is the party to act. In the last, unless the street is opened the parties on each side should join in making the drain.

16.—INSPECTION AT TRAINER, DELAWARE COUNTY.

By WM. B. ATKINSON, M. D., *Medical Inspector*, on account of epidemic of Diphtheria.

August 20, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Trainer, Delaware county, on August 17 and found the following conditions to exist:

The population of Trainer is about 900. The people are largely employed in the ticking mills, and are located in houses owned by the Trainer Company. The place has no government other than a township. The drainage is almost wholly on the surface. The water supply is abundant and of good quality. Diphtheria began here in March, when one child died. No other cases occurred till July; since then it has prevailed with great mortality—some fifteen cases with ten deaths—as follows:

1. McFadden, March 5, on the Main street east of the railroad; only child died.

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2. Hennick, July 2; eight children, one sick and died; house located at a distance from the first case, near the Keystone Brick Company and away from the built up portion of the village.

3. Fulton, July; two sick one died; house located on State road a short distance from case one.

4. Vandegrift; eight children, two sick, one died; located on Main street near the mill, some distance from one and three, near two.

5. Groce; six children, two sick, one died; located in row near No. 4.

6. Foster; five children, one sick and died; located on street near mill.

7. Gray; 8. Fulton; 9. Smith, and 10. Taylor; all occurred near each other as to time, and all located in same row with case 6.

At the time of my inspection others were ill with sore throat; in some pronounced to be diphtheria. In addition one family had eight children, all of whom had sore throat, and in other families even the older people were affected, but to a less degree.

In looking for the cause of this epidemic I was shown three dumping grounds for the cesspool filth from Chester and South Chester. The location of these dumps will be seen on the accompanying plan, giving the exact location also of each death, etc. While it is highly objectionable to place large quantities of this filth on the open surface without any effort at disinfection or at covering it with fresh earth, I am not prepared to say that this is to be regarded either as the cause of the disease or of its continuance.

As before remarked the drainage of the place is on the surface, and in several instances the filth from cesspools, with all other flow from the houses, is allowed to run in an open gutter to the main street, and thence by a pipe beneath the street to the other side, where it makes its way over the surface to the creek. Especially is this the case from a small alley between the property of G. L. McC. and that of J. McE. I was informed that the cellar of the McF's. was full of water during the winter. The cellar of S., I found very damp from a neighboring drain.

The four houses where V. resides are without cellar but have a vault in the rear of the first story. This is objectionable and should be remedied. The lower room in each is much used as a living room and is extremely liable to have drainage from the high ground beyond flow and accumulate beneath. Several of the cellars in the row occupied by Smith & Co., where so many fatal cases have occurred, are poorly ventilated. In one cellar chickens were formerly kept but these have been removed.

While lime or whitewash had been employed freely, yet few appeared to have a correct idea of the proper method of sulphur fumigation. In each instance I explained the process and urged its performance. Nor was isolation of the sick attempted, as far as I could learn, in any family.

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I would recommend that each house where fatal cases have occurred be thoroughly and carefully disinfected.

That all cellars be well ventilated, and where drainage comes in that steps be taken for its exclusion.

That the cesspools in every case, but especially those draining into the alley of McV. and McE. be cleansed, and some method be instituted to prevent any escape of this filth into the alleys; that the gutter here, as well as that at Trainer street, in front of the houses of B. and H., be laid with terra cotta pipe so that all the drainage may be carried to the pipe beneath the street and to a sufficient distance beyond to abate this nuisance.

That the owners of the premises who permit or receive the cesspool filth on dumps be required to have pits dug and the filth each time covered with fresh earth.

17.—INSPECTION AT MUNCY, LYCOMING COUNTY.

By GEORGE G. GROFF, M. D., Member of the Board.

LEWISBURG, PA., *August 29, 1892.*

In accordance with your request I visited Muncy Creek township, Lycoming county, and examined an alleged nuisance on the premises of I. B. On these premises, situated in the open country, one-half mile from Muncy, I found a small slaughter house with a yard adjacent containing fifteen or twenty hogs. The house and also the yard are situated on the course of a wet weather stream which discharges into Glode creek at a point between the borough of Muncy and Muncy Creek township, where the latter is so thickly settled as to become a subject of Muncy. I found the slaughter house, and also the yard adjacent in which the hogs are kept, entirely free from any odor or other source of offense. I should judge that the present number of hogs are abundantly able to consume all the offal produced on the premises before it can become offensive. The blood runs into a trough and is consumed by the hogs as all the other offal is consumed. I followed the run through the weeds and bushes for a considerable distance but detected no cause of offense. From the situation of the slaughter house and the hog yards I should suppose that at times of high water the droppings of the hogs would be carried down to the village below and become a source of offense. If at any time there should be no hogs in the yard then the offal would work down and become offensive. As the premises now are I could not condemn them.

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I would suggest to Mr. B., however, that it would be well to move the house and the yards back from the run which can be easily done so as to prevent future complaints. I think the premises are located as they are in order that the hogs may water in the run when there is water there. The present location undoubtedly ought to be abandoned.

It may be well to add that I was unable to find a single one of the complainants, though I was at a number of their homes. The women at some of these houses knew nothing whatever of any nuisance. One man living directly along the creek complained of, and in the center of the district where the complainants reside, said he had never heard of any nuisance of the nature named, hence I think it cannot be a very serious matter.

18.—INSPECTION AT WAYNE, DELAWARE COUNTY.

By WM. B. ATKINSON, *Medical Inspector*, on account of unsanitary condition of Italian settlement.

September 12, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Wayne on September 10th and found the following conditions to exist:

The Italian settlement is occupied by about fifty houses or huts, which serve as shelter for two squads of men of fifty and one hundred men. They are employed in the quarry at this point, and in building work here and in the neighborhood. Messrs. Fritz & Johnson are the owners of these huts and rent them to these laborers. Mr. Stauffer is also one of the employers. On one side were nearly one hundred men who had two water closets and on the other fifty with one closet. For the women were other closets which were kept locked. From the general appearance of the place it did not seem as though the men wasted any time in using their closets, the ground showing that it was used for the dumping of excreta in every direction. Although the employers had put up notices requiring care and proper policing; these were torn down and not attended to, save in a very few instances. There is nothing but surface drainage, and the ground is strewn with slops, old clothing, refuse food. The houses and the entire place demand a thorough sanitary policing, and were it possible, the huts should be removed and the settlement taken to some place where it would not be, as it constantly is, a menace to the health of one of the handsome suburbs of Philadelphia. I would recommend, if this move can be accomplished, that no long delay should be permitted, as should other emigrants arrive from infected

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places, the soil is in a fertile state to receive contagion, and not only these people would be the early victims, but it would seriously menace the safety of the people of Wayne and other near villages.

Mr. Frank Smith assured me that the authorities of Wayne are ready to do what may be in their power to abate this nuisance as soon as they are informed by the Board as to the proper steps.

In a report on this place a year or more ago, I gave the items as above and I do not find the slightest evidence of any improvement.

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19. INSPECTION AT PITTSBURG, ALLEGHENY COUNTY.

(Water Supply). By BENJAMIN LEE, M. D., *Secretary of the Board.*

PITTSBURGH, *September 11, 1892.*

To His Honor WM. M. KENNEDY, *Mayor of the City of Allegheny:*

SIR: In compliance with a request received from your office yesterday, I to-day made a personal inspection of the water supply of your city. As the result of my observations, I am compelled to declare that it is polluted to an extent which makes it at all times dangerous. Receiving, as it does, the sewage of a population of about seventy-five thousand of Pittsburg's population, including that of one large hospital, in addition to the entire drainage of the eastern end of your own city and adjacent boroughs, the almost stagnant pool from which the water is pumped, affords an admirable breeding place for disease germs of every kind. A single case of cholera occurring on either shore above the influent pipe might and probably would be followed by consequences too horrible to contemplate. The wide extent of territory which has recently been infected by this contagion in Europe will render this country liable to outbreaks for a year to come. In the present threatening condition of affairs, when every day brings us intelligence of its increase in the principal port of our country, it may make its appearance here at any moment. To delay immediate efforts to avert such a calamity, by carrying the influent pipe to a point above the city, which would avoid the introduction of this great flood of filth into your reservoirs, is criminal folly. I cannot find words to express myself strongly enough in condemnation of such negligence. Nor do I allow myself to doubt that the intelligence of your citizens will support you in any measures, whatever expense they may involve, for averting the peril which now threatens them, and that it will therefore be unnecessary for the Board to issue any mandatory order in the premises, which, however, it is prepared to do should occasion demand.

I have the honor to be, sir,

Yours respectfully,

BENJAMIN LEE,

Secretary and Executive Officer.

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20.—INSPECTION AT JOHNSONBURGH, ELK COUNTY.

By S. M. FREE, *Medical Inspector*, on account of sewage of the N. Y. & P. Co., Armstrong Real Estate Company and Armstrong Hotel.

DU BOIS, PA., *Sept. 23, 1892.*

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Johnsonburgh on September 19, 1892, and found the following conditions to exist:

The sewage of the New York and Pennsylvania Company is in part introduced directly from the mill into the Clarion river, and in part (the chloride washings), into a large stone sewer, which, in turn, discharges into a ditch running about 400 feet through a lot to the river. I find no nuisance here.

The sewage of the A. R. E. Co. is that from two three-story and ten two-story brick buildings, occupied as stores on first floor, and residences or offices on second and third floors. Situated in a block on east side of Market street. These buildings connect with a terra cotta sewer 16 inches in diameter, extending north about 450 feet under Market street where it connects with a 20-inch sewer of some kind extending to the foot of Market street, at Johnsonburgh railroad tracks. From this point the sewage runs in an open ditch a short distance south along the tracks of the Johnsonburgh railroad, thence across the tracks in a wooden box, thence north in an open ditch to Centre street, and along Centre street to near the tracks of the N. Y. L. E. & W. Ry., where it crosses the street, thence south to a culvert under the N. Y. L. E. & W. Ry. tracks, which culvert connects with the large stone sewer of the N. Y. & P. Co., above mentioned. This is undoubtedly a nuisance from the foot of Market street to the mouth of the N. Y. L. E. &. W. Ry. Co.'s culvert. I find on inquiry that the A. R. E. Co. and citizens have done all in their power to abate this nuisance by offering to put in a terra cotta sewer from foot of Market street to N. Y. L. E. & W. Ry. Co.'s culvert. The difficulty has been as follows: The Johnsonburg railroad, under advice from its counsel, declines to allow individuals or corporations to place sewers under its road-bed. It has offered the privilege of doing so however to the borough council. The council has refused to order a sewer put in at this point, and has not asked the privilege from the railroad company. I understand that the action had been taken a few days before I made the inspection and that this nuisance will soon be abated.

This is a hotel of sixty rooms with modern improvements. It has regular daily inhabitants to the number of eighty. All the waste from the urinals, water-closets, wash-basins, and part of that from the laundry and kitchen goes into a terra cotta sewer which empties into a ditch

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along the New York, Lake Erie and Western railway and Pittsburg and Erie railroad tracks: thence it flows south about 400 feet to a box, thence across the Pittsburg and Erie railroad tracks through a box to an open ditch, thence southwest across a wagon road into a field.

The company owning the hotel has made every effort to carry their sewer across the Pittsburg and Erie railroad tracks, but the railroad company which owns and operates the Johnsonburgh railroad refuses to allow individuals and corporations to lay sewers under its tracks. The borough council has been appealed to and thus far has failed to act, though it needs only to ask the privilege of putting a sewer under the Pittsburg and Erie tracks, when the company will grant it.

After careful inquiry the responsibility of these nuisances appears to rest upon the borough council for failing to put up sewers across the tracks of the Johnsonburgh railroad and of the Pittsburg and Erie railroad.

For the abatement of these nuisances I recommend that the council of Johnsonburgh be asked to immediately put in a sewer from the foot of Market street to the large sewer owned by the New York and Pittsburg Company and lying northwest of the New York, Lake Erie and Western railway tracks. Also that it be continued a covered sewer from the west side of the Pittsburg and Erie railroad tracks to Clarion river, instead of an open ditch as at present. That the council be asked to immediately put a sewer across the Pittsburg and Erie railroad tracks about 300 yards east of the passenger station, and continue it thence to the Clarion river. That when this sewer is completed, the owners of the hotel and the house be requested to connect their sewers with it.

If the council can be induced to act promptly in this matter it will be only a short time until these nuisances will be abated.

I enclose a blue print of the borough made in 1890. I have traced in pencil the present course of the sewage causing nuisances in so far as I was instructed to make inspection. I have marked the space containing terra cotta or stone sewers thus —— ——. Parts of the pencil tracing not thus marked are open gutters or ditches.

The New York and Pittsburg Company deserves much praise for the excellent sewer put in by them. It cost them about $10,000. They will be glad to allow the council of the borough to connect their sewers with it without charge.

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21.—INSPECTION AT McKEESPORT, ALLEGHENY COUNTY.

By J. R. THOMPSON, *Medical Inspector*, on account of report of Small-pox.

September 27, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited McKeesport on September 22, 1892, and found the following conditions to exist: Population 20,000; incorporated; Dr. William E. Walker, health officer; Thos. Tilbrook, mayor; Drs. Charles and R. J. Beack, county physicians; sewer drainage, water works; one case of varioloid and one case of small-pox; diagnosis verified by three physicians of the town. First case occurred about a month ago. Type of the disease in the case of young man now ill is confluent as to the face, discrete as to the body. Precautions taken: vaccination, isolation, disinfection, etc. Would write to Colonel Glenn, superintendent Poor Farm, Allegheny county, and urge the necessity of every precaution being taken by the county physicians.

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22. INSPECTION AT LANSDOWNE, DELAWARE COUNTY.

(Drainage.) By W. H. BOARDMAN, C. E., *Engineer Inspector.*

On September 12, in company with Mr. Howard Murphy, C. E., member of the Board, I visited Lansdowne, Delaware county, Pa., to examine the plans of the proposed system of sewerage at that place. We met Mr. A. L. Pennock and Mr. Thomas G. Janvier, C. E., who gave us all the information they had bearing on the subject.

At present the only method of disposing of the sewage is by means of an open ditch passing through the town and empting into Darby creek. Into this open sewer flows all the drainage from a large number of dwellings, including the overflow of their cesspools, and forms an abominable nuisance that should be abated at the very earliest possible moment. Notwithstanding this, we were informed that but few of the citizens have taken any interest in the matter.

The proposed plan of abating this nuisance is by laying about ten thousand lineal feet of eight, six and five-inch sewer pipe, carrying the sewage to a large receiving well to be located on Darby creek. From this well a large part of the sewage was expected to percolate through the soil into the creek, the solid matter remaining in the well to be hauled away and used as manure on the surrounding farms. The area of the proposed disposal field is only about three-fourths of an acre, the surface of which is a gravelly clay underlaid with rock.

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The area of the disposal field is entirely inadequate to perform the work that will be required of it, and the soil is not a kind well suited for surface disposal.

It is becoming more and more apparent every day that some means must be devised to dispose of the sewage of the towns situated along the Pennsylvania railroad, as most of them are becoming thickly inhabited, with no means of sewage disposal except that of the ordinary farm house.

I am informed, on reliable authority, that a company has been formed and surveys are now being made to build a large intercepting sewer along Darby creek, from Berwyn to a point above Clifton, with a view of ultimately extending it to tide water. This plan deserves the hearty support of all the inhabitants of the territory that could be drained by this sewer, and all health authorities.

If this intercepter is built, the sewage of Lansdowne could be very satisfactorily disposed of by connecting their system with the intercepting sewer, which when built will pass somewhere in the neighborhood of their proposed disposal field. As the present state of affairs at Lansdowne is very prejudicial to health, something must be done immediately. The proposed system will, beyond doubt, be a great improvement over the existing conditions. Their piping system should be provided with the ordinary arrangements to keep the pipes from becoming obstructed, and the whole designed so that the system could easily be connected with the intercepter when finished. If this intercepter is not built, Lansdowne will be compelled to make other arrangements, as the proposed plan will be but temporary.

Great care must be exercised in removing the material from the well. Sealed tanks similar to those used in the city, should be used for this purpose, and the material distributed over different pieces of ground daily.

By direction of the Chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, this report had been withheld until he could consult with you and other members of the Board as to this situation, which he did after the Board meeting in Philadelphia yesterday. After consultation with him to-day, it is respectfully recommended that the Board approve of a properly designed sewerage system throughout Lansdowne and vicinity to discharge into Darby creek, provided the best obtainable temporary means be adopted to purify the sewage before discharge, provided that the whole system be so designed and located as to form part of a comprehensive sewerage system for the entire Darby creek valley; and provided, as always, that nothing be done or maintained which shall be prejudicial to public health.

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23.—INSPECTION AT NEWCASTLE, LAWRENCE COUNTY.

By J. R. THOMPSON, *Medical Inspector*, on account of cases of Small-pox.

September 27, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Newcastle on September 23, 1892, and found the following conditions to exist:

Population 11,000; incorporated; health officer, David Shatser; mayor, John B. Brown; sewer drainage; water works. Diagnosis verified by Dr. Rob't Bell, city physician, and two other physicians of the town. One case of varioloid; five cases of small-pox. Started from varioloid September 14, 1892, at the W. House, the case being young Miss H., then her two sisters took small-pox from her, Ella and Carrie C. H. Ella died prior to my visit. Carrie was very low when I saw her, with confluent as to her face, discrete as to the body. Mrs. S. K. is confluent as to face, discrete as to body. She was vaccinated in her youth. W. F. E., discrete form, convalescent. Precautions: Vaccination, isolation, disinfectants, special policeman stationed at each house. The cases are scattered through the town. Everything is being done to control the disease.

(*b*)—PASS FROM THE MAYOR.

MAYOR'S OFFICE,
NEWCASTLE, PA., *September 23, 1892.*

This is to certify that the bearer, Dr. J. R. Thompson, is a representative of the State Board of Health of the State of Pennsylvania, and visits houses where small-pox exist in our city with my authority and approval.

JOHN B. BROWN,
Mayor.

24.—INSPECTION AT BRYN MAWR COLLEGE, MONTGOMERY COUNTY.

By WM. B. ATKINSON, *Medical Inspector*, on account of location of infirmary.

October 4, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited the college on October 1st, and found the following conditions to exist:

The building in question was formerly the laboratory, but now being vacant it was proposed for use as an infirmary in case any of the pupils were so ill as to require removal from the dormitories. The building is one story in height and in every way admirably fitted for the proposed

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use. The only question is its location, being on the Gulf road, which is used mainly by those who attend a church above and by occasional travelers. The dormitories are located to the east and south, the nearest point being about sixty feet. I am assured by the authorities that in every instance isolation and the most thorough and careful disinfection has been practiced.

After the most thorough deliberation, I feel, that at present, there exists no need for the interdiction of the use of this building for the purpose proposed.

25.—INSPECTION AT HOMESTEAD, ALLEGHENY COUNTY.

By BENJAMIN LEE, M. D., *Secretary of the Board.*

1532 PINE ST., *October 3, 1892.*

To the Carnegie Steel Company, Homestead, Pa.:

GENTLEMEN: At your request, the undersigned, on the 12th day of September last, made an inspection of the works of your company at Homestead, in order to determine whether conditions prejudicial to the health of your employes, or of the general public, existed within said works, and if so, to suggest the remedy for the same.

We found the works distributed over an area of about sixty acres. Inside this enclosure there was a population, as we understood, of something over two thousand—principally men, although a few of them had their families with them.

Sleeping Accommodations.

The sleeping accommodations consisted of six bunk houses, thirty tents, three barges, and a number of newly constructed, three room, frame houses. As many of these latter were in process of erection, it was impossible to determine the exact number available as dormitories. The bunk houses had a floor space of 90x30 feet, with walls about 10 feet high, and roof sloping to a ridge pole. Such a house contained a hundred bunks. We estimated that this gave each occupant an air space of about five hundred cubic feet. The sleeping tents had a floor space of 24x40 feet, with walls about 5 feet high, sloping to a ridge pole. These were occupied by thirty-five men each, affording each occupant a little over three hundred cubic feet of air. The allowance in the barges was somewhat greater than that in the bunk houses. The houses were two stories in heighth, contained three rooms of the measurement of 16x16 and 16x12. They were occupied by small families. The dormitories were in charge of watchmen whose duty it was to see that proper ventilation was maintained, and that the premises were kept clean. It is our opinion, therefore, that there was no over-crowding or deficient ventilation which could have caused sickness among the men.

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Cess Pools.

The houses were erected on streets. In the middle of each street, in the rear of the houses, was a large cess pool, 12 feet deep, with separate accommodations for from eight to ten persons. Everything was scrupulously clean in and around these houses, no deposits of ordure being found.

Drainage.

The drainage was principally on the surface, leading into large sewers. In one or two places only there was a little standing water, but this was not offensive. A ditch which had been left open in introducing water pipes, had been made the receptacle of house rubbish, but not of garbage.

Water Supply.

There were three sources of water supply. First, an old and deep well supplying clear, cold water, which had been shown by recent analysis to be pure. This was situated about five hundred feet back from the river on a high bluff. Second, a pump on the hillside, quite high up and outside of the works, although much used by the employes, and third, the river water pumped up and distributed all over the place by iron pipes. Samples of each of these waters have been analysed by Dr. Henry Leffmann, Chemist to the Board. The first source, namely, the deep well, is that which the company supplies for drinking purposes, but the river water being very accessible, by reason of the numerous hydrants, it can readily be understood that it will often be drunk when the purer water is not at hand. The intake of the pump for the river water is so situated that it cannot fail to receive the drainage not only from these works, but from others situated higher up the river. The analyses have already been forwarded to you.

As was to have been expected, this water is entirely unfit for drinking or household purposes, in connection with the preparation of food, unless boiled.

Garbage.

As the preparation of food is almost in the hands of the company, the garbage is created in but few places and is easily taken care of. It is buried in large pits every day. One of these pits was found full up to above the level of the ground, but there was no drainage from it.

Food.

The food was brought from Pittsburg on two steamers, making two trips each daily. It was therefore fresh, and no complaint was made of its quality. It was served in seven dining rooms, which were clean and provided with all necessary table furniture.

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The Sick.

We found eight men and boys in the hospital. If they had been suffering from different ailments, the proportion of sick out of so large a number would not have attracted attention. But they were all affected in the same way, with diarrhœa and slight fever. Obviously there was one local cause at work to produce the same result in so many instances for we were told that quite a number had been sent to the hospitals at Pittsburg with the same symptons. As no cause for this sickness could be found in the location, the food, the sleeping accommodations or the drainage, we are reduced to one conclusion, which is that it is to be sought in the river water. Our recommendations are, therefore, either, first and most desirable, that the river water be made inaccessible except for use in case of fire, for filling boilers, flushing dams and similar purposes, and that the water from the old well be conveyed all over the place in pipes, and distributed by hydrants as the river water then was. Second, and less to be recommended in case the well aforesaid will not supply water enough to be thus distributed. That large tanks of it be placed in accessible situations labeled "Drinking water," and that a distinct placard be attached to each hydrant through which the river water is distributed "This water is not fit to drink." This notice should be in English, German and Sclavonic.

We would reiterate certain recommendations made upon the spot, viz: That no open ditches be allowed to remain upon the premises in the neighborhood of dwelling houses; that all natural streams running through the property be kept scrupulously clean and occasionally strewn with quicklime and copperas; that the manure be frequently removed from the stable; that each time that garbage is deposited in a pit fresh earth be thrown upon it, and that when the accumulation has reached within one foot of the surface it be thickly strewn with quicklime and then covered with fresh earth even with the surface. Cremation of this material would be a still better way of disposing of it, and with the furnaces at the command of the company should be attended with no difficulty.

It would have been much better to have adopted the dry earth closet system than to have dug cesspools which are eventually always disease breeders. It might be well to gradually introduce that system in place of the present. Until that is done chloride of lime and copperas should be freely used at regular intervals in the cesspools. This is suggested simply as a matter of precaution for the future, and not with the idea that these places are responsible for the present sickness, as they are much too recent for that to have been the case.

A statement furnished at our request by Dr. E. E. Wible, surgeon to your company, shows that on the thirteenth day of September there were fifty-six cases of the diarrhœal affection referred to above out of a population of twenty-nine hundred employed in all ways in and around

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the works. Less than one-fourth of these were sufficiently ill to make confinement to bed necessary. At the same time these figures are strongly confirmatory of the impression received at the time of the inspection, that there was a common cause existing for the prevalence of the disease, and that cause the water.

26.—INSPECTION AT COOPERSDALE, CAMBRIA COUNTY.

By PETER FELIX, ESQ.

COOPERSDALE BOROUGH, JOHNSTOWN, PA., *October 10, 1892.*

Our borough council took action in regard to your communication and request, and instructed me to act as inspector of our district. I have fulfilled the duty imposed on me and reported to council. They have ordered all the nuisances to be cleaned up as far as is in their power to act.

1. The pig pens were in a very bad condition, and the street commissioner has served notices on all the people who possess pigs to place their premises in a fit condition for the inspection of council or they will be fined accordingly.

This matter will not need any more attention from council as the street commissioner will discharge his duty in regard to it.

2. The water closets in the borough are mostly vaults in the ground, and I found an unusually large number of them in a very bad condition (considering the very dry weather). When rain comes there will be a number of them overflow owing to no sewer or drainage to carry the material and water away.

This matter has also been presented to council and notices have been served on all of them to put their closets in good condition.

3. Our people have been insulted by having refuse and garbage hauled through the town in daylight in open wagons and being dumped just outside of the borough limit in West Taylor township, where the cattle get at it and eat it. There have been several milch cows poisoned and died from eating it as well as a number of hogs. We have been trying to put a stop to this for some time but without success.

4. On ground owned by Cambria Iron Company and leased by C. O. L. in West Taylor township, adjoining Coopersdale borough, there is located a tallow factory and hide storage which we consider a public nuisance, but are unable to make a case out of it as it seems that a thing of this kind is pretty hard to get at; nevertheless the citizens of our borough must suffer it to remain and bear the offensiveness of it.

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5. The majority of the houses in the borough are owned by the people who live in them, and as a general thing they take pride in keeping them in pretty good order.

6. Our alleys and streets are in no fit condition for a borough. They are mostly very poorly kept, and as council has no means to fix them we can see no way out of this difficulty. The alleys are very unhealthy.

7. The fever has been in several families this summer and is still with us. We think the lack of sewerage has a great deal to do with it. This we cannot overcome on account of having no means to better the condition of sewerage.

8. The most unfavorable thing I have to communicate is the unhealthfulness of the cellars in the borough. Over one-half of the cellars are in no fit condition to live over. Property holders desire to remove this condition but cannot for lack of sewers to drain into. This council cannot handle the sewer question and people must abide by the consequences.

9. Sewers. This is the question that puzzles council and the people. No money means no improvements and no improvements means no sewers. Our treasury is drained each year for the purpose of paying off a debt that was contracted by the council in 1891. This debt will exist for about eight years yet, and that means no money for sewers for that length of time. We have people who have offered one dollar per foot frontage for the privilege to tap a sewer but there is none to tap.

We appeal to you for some suggestions in regard to this matter, and if we could prevail on you making us a visit and inspecting some of the cellars in our borough we know you could make some recommendations that would benefit our borough.

(*b*). LETTER TO PETER FELIX, ESQ., BY THE SECRETARY.

October 20, 1892.

PETER FELIX, Esq., *Burgess of Coopersborough (Johnstown), Pa.:*

DEAR SIR: I have to acknowledge with much pleasure the receipt of your carefully prepared report of inspection of Coopersborough and vicinity. I am especially glad to know that many nuisances which you discovered have been brought to the attention of the council and the street commissioners, and that you feel confident of being able to abate them. You have ample power to do so, and I trust that you will use it.

Everything depends on having a good strong ordinance specifically conveying the powers conferred upon council by Legislature to the proper officers.

I send an order for abatement of the tallow factory nuisance, and if you will send me the name of the person or persons who are dumping garbage as described, I will also send an order for abatement of that nuisance.

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With regard to the lack of sewers, our Board has absolutely no power to order their introduction. That matter lies entirely with your council, and if, as you say, you have reached the limit of your indebtedness, you will have to wait until you get money, unless you can induce the Legislature to pass a special act authorizing you to issue bonds for the purpose. This, I presume, to be very doubtful. The only thing that you can do is to have cellars which actually contain water pumped out, and to keep lime and copperas liberally strewn in all damp cellars.

If you will send me the names of all townships contiguous to Coopersborough, I will send you a certificate of appointment as Deputy Inspector.

Yours very truly,

BENJAMIN LEE,

Secretary.

27.—INSPECTION AT MORRELLVILLE, CAMBRIA COUNTY, PA.

By W. E. MATTHEWS, M. D., *Medical Inspector*, on account of Nuisance—Slaughter House Polluting Bloody Run.

JOHNSTOWN, PA., *October 12, 1892.*

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Morrellville on October 12, 1892, and found the following conditions to exist:

Morrellville is a recently incorporated borough of about four thousand (4,000) inhabitants, James Herrington, Esq., being the present burgess. The borough is situated about one mile below Johnstown on and near the left bank of the Conemaugh river. Bloody run is a rather small stream flowing into Spruce run. The waters of Bloody run flow through the entire length of the borough. I followed Spruce run from its mouth to the mouth of Bloody run, thence I went up Bloody run to its source. I found but one source of filth polluting the stream, namely: T. & Co.'s slaughter house. It is situate on Bloody run well toward the upper end of the borough and the inhabited portions of the same. From the slaughter house down both Bloody run and Spruce run are polluted by filth from this slaughter house. Some parts of the streams within the borough and near residences are in a very filthy condition, and the odor arising therefrom is very offensive.

The filthy condition is due to three causes:

1. Much filth (blood, offal, etc.), from the slaughter house finds its way into the stream.

2. The stream is sluggish, has a rough bottom, considerable vegeta-

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tion grows on the banks and in the stream, and the water is at present very low and unable to carry off the filth. There is no way of flushing the stream.

3. Spruce run formerly was a rather strong run and helped to carry off the filth after it reached the mouth of Bloody run, but Spruce run is entirely dry at present. This is due to the erection of a dam or reservoir near the source of Spruce run. Pipes from the reservoir carry all the water (during this dry spell) to other parts of the borough.

The inhabitants living near Bloody run and Spruce run below the slaughter house have just reason to complain. The parties who made affidavits before the burgess are respected citizens and the owners of property along the stream, where they live.

The owners of the slaughter house claim they do not wish to create or maintain a nuisance, yet it is true they pollute the stream with filth, greatly to the annoyance and damage of the people living near the stream below.

There is considerable feeling existing between G. H., one of the principal property owners below the slaughter house, and the borough authorities, on account of recent litigation he had with the borough, hence he is slow to ask any favors of councils, and councils would be as slow to grant them to him. Mr. H. certainly has a just cause of complaint. His property is greatly reduced in value by reason of the filthy condition of the stream.

The solution of the problem is to stop the pollution of the stream from the slaughter house, or pipe or arch the stream to below the inhabited portions of the borough. The former is the most practicable.

The borough officials will act with you in any measure you may adopt to abate the nuisance. They want no nuisance in the borough.

The natural drainage of Morrellville is good. Several large sewers are being laid by the borough, which will be of great sanitary benefit.

The water supply is fairly good, coming from reservoirs fed by the mountain streams.

There are no epidemics prevalent and comparatively little sickness of any kind.

28—INSPECTION AT BOLIVAR, WESTMORELAND COUNTY, PA.

By W. E. MATTHEWS, M. D., *Medical Inspector*, on account of a Nuisance Caused by a Slaughter House.

JOHNSTOWN, PA., *October 22, 1892.*

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Bolivar, Pa., on October 22, 1892, and found the following conditions to exist:

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Bolivar is a small borough of about five hundred inhabitants, but including the surrounding territory (which is rather thickly settled) there is a population nearly double that of the borough proper.

The complaint made by Mr. W. R. A. is to points outside of the borough limits, in the township. The accompanying rough diagram (drawn from sight without any measurements), will show the location of the slaughter house, residence of W. R. A. and the C. Church. The members of the church and Mr. A. are the complainants.

Mr. W. is the butcher and the man who maintains the nuisance. Mr. W. butchers three beeves weekly, besides sheep, lambs and other smaller animals. All the blood and other filth goes into this water-course, which runs through the property of Mr. A. and the church property. This run contains no water except during freshets. It is entirely dry at present. The little water used in the slaughter house only washes the filth from the slaughter house a short distance to the premises of the neighbors below.

The remedy here is to stop Mr. W. throwing his filth in this stream or run, and keep his premises and slaughter house clean.

The surroundings of the slaughter house are in a filthy condition. Beef heads by the score are lying around the place.

The constable of the township is F. P. Louther, West Fairfield, Pa., and James Corsin, of Bolivar, Pa., is road supervisor.

The water supply of the place is largely from wells. The water is plentiful and of a good quality. Place rather healthy. Natural drainage good.

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29. INSPECTION OF THE CLARION PUBLIC SCHOOL, CLARION COUNTY.

By J. W. GREENLEAF, *Secretary of the Board of Health, of Clarion.*

September 20, 1892.

The school is situated on the Main street, and was erected in 1885. It is a graded school, the principal is L. L. Himes. It has nine school rooms, ten teachers, has an average attendance of 168 boys, and 175 girls. The play ground is 180 feet by 180 feet, it is paved with earth, has no flowers, grass or trees. The general surface has a slope of one foot fall in fifteen feet, sloping in all directions from the building. There is no water near except what stands in the privy vaults. The only nuisance in the neighborhood is that due to the travel on the public street.

The building is of brick and stone, having two stories above the basement. The basement is used solely for the heating apparatus, and

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the stories for class rooms. It is in good condition, and as far fire proof as any brick building. There are no other fire escapes than the stairs and hallways, and the rooms cannot be cut off from the stairs in case of fire. The doors open inwards. The stair case is four feet wide, tread ten inches, height of riser seven inches. There are no curved or angular steps. The plan of the building is good, there being a large hall clear through from east to west, and pupils can enter on three sides, and pass up stairs without disturbing the lower rooms. The rooms are 32 feet by 22, are 14 feet in height, with a cubic capacity of 9,856 feet. The average attendance during the most crowded period was fifty, the cubic space per scholar 200 feet.

The windows are not opened during cold weather. The Smead system of ventilation is used. There are transoms over the doors, but these are not kept open during cold weather. The windows are double in each room; there is one hole in the wall twenty by twenty inches near the floor, and six ventilating flues leading under the floor to a vent stack; these are about twelve by sixteen inches in dimensions. These are heated in the stack by a jet. The foul air discharges at the top of the building. The draught is not regular and is strong at times. There is one hot air flue in each room. The ventilation is generally good. The heating is by hot air furnaces, four in number, the inlets for fresh air being two and a half by three and a half feet, two to each room. These are sixty-feet from the privies. Thermometers are kept in all the rooms, the temperature preferred is sixty-eight to seventy degrees.

The cellar does not extend under the whole house, is eight feet high and not well lighted, though well aired. The floor is of brick and earth, and is kept neat. It is occasionally damp. It is never used as a play room. There is no dampness of the house.

There are two cesspools, covered by two rudely constructed buildings, about 12 by 12 feet, in which water and excreta stand the year round. These buildings are situated 60 feet from the fresh air inlets of the four class rooms, one on each side of the play ground.

This position is objectionable. They are neither lighted nor warmed. They are ventilated by means of a 6 by 6 board duct from the cesspool to the top of the building, which is about eight feet high. They are in miserable repair. Nothing is done to keep them clean, save a weekly scrubbing of the seats and floors. They are truly offensive. They may be used at any time during the day, but are locked up at night. The privies are on different parts of the ground, separated by a fence, and one is for the girls the other for the boys.

The drinking water is good, is furnished by a mountain stream. There are spigots on each floor. The waste pipes are trapped as well as the drains, which discharge into the drain. The soil is gravel.

Each desk and seat is separate, and of two sizes, corresponding to the ages, 6 to 18 years in the nine rooms. The height of the seats is 17, 16,

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15, 14, 13 and 12 inches. If a plumb line were dropped from the edge it would fall on the outer edge of the seat. The children do not need foot rests.

The black boards are stone, slate and painted walls. None are placed on a side where there are windows.

The blinds and shades are blue with spring rollers, and do not darken too much nor obstruct the air in summer.

The walls are white in color, the ceiling also white. The rooms are a little dark on very dark days. A neighboring dwelling cuts off the light. In no rooms do scholars face the windows. The ratio of window surface to floor surface is .27.

The printed text books and maps are not bad for the eyes. There have been complaints by teachers and scholars of trouble with the eyes.

The clothes are kept in separate rooms. Four of these have no opening save the door. Each child has a hook, and the clothes of but one are placed on this hook. There are no mats nor scrapers, and when children have wet feet they take off their shoes and dry their feet at the register.

No vaccination record is kept. No examination has been made as to the number of scholars vaccinated. The percentage of absences for illness during the year has been very small.

The experience of the past year has shown much complaint of headache, progressive loss of strength, defective sight; but as we now have proper drainage, we look for a better condition in many ways this year. Absences are most frequent in January and February on account of cold and wet weather.

Pupils known to have contagious affections, or who have been exposed to such, are not admitted without a medical certificate.

The school hours are 9 to 11.50 a. m., 1 to 3.50 p. m. Recess of ten minutes each half day. No recess in advanced rooms. Young scholars are dismissed at 11.30 a. m. and 3.30 p. m., in addition to their recess. They are allowed periods of rest and physical exercise. During the recesses the teachers look after the pupils on the play ground.

Since the present appointment as a board of health, we are agitating for inside water closets for teachers and larger pupils who have sense enough to use them properly. We are also urging proper drainage for the outside closets.

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APPENDIX C.

QUARANTINE, DISINFECTION, EPIDEMICS AND SPECIAL SOURCES OF DISEASE.

1. Quarantine:
   - (a) Regulation Adopted by the Board at the Meeting of November 10, 1892.
   - (b) Resolution of Philadelphia Board of Health Relative to Rags from Foreign Ports.
   - (c) Transportation of Bodies Dead from Diphtheria.
   - (d) Cholera.
   - (e) Interstate Notification of Disease.
   - (f) School Laws Re-contagious Disease.
2. Epidemics:
   - (a) Small-pox at Point Pleasant, Bucks county.
   - (b) Typhoid Fever at Greencastle, Lawrence county.
   - (c) Small-pox at Morrisville, Bucks county.
   - (d) Diphtheria at Erie, Erie county.
   - (e) Diphtheria at Locust Gap, Northumberland county.
   - (f) Scarlet Fever at Eldred, McKean county.
   - (g) Small-pox at Tower City, Schuylkill county.
   - (h) Small-pox at Titusville, Crawford county.
   - (i) Diphtheria at Seven Valley, York county.
   - (k) Small-pox at Pittsburgh, Allegheny county.
   - (l) Typhus Fever at Hazleton, Luzerne county.
   - (m) Small-pox at Mill Creek, Huntingdon county.
   - (n) Small-pox at Coudersport, Potter county.
   - (o) Diphtheria at Kirkwood, Lancaster county.
   - (p) Small-pox at Allentown, Lehigh county.
3. Special Sources of Disease:
   - (a) Food Adulteration.
   - (b) Pollution of Water Supply at Harrisburg.
   - (c) Typhus Fever.
   - (d) Diphtheria from Untrapped Sewer.
   - (e) Leprosy.
   - (f) Pollution of Water Supply at Scranton.
   - (g) Sewerage of Reading, Berks county.
   - (h) Tuberculosis in Cattle.
   - (i) Water from Well at South Fork.
   - (k) Floods and Fires at Oil City.
   - (l) Slaughter House Nuisance at Greensburg, Westmoreland county.
   - (m) Destroying Soiled Articles of Clothing.
   - (n) Small-pox Body Not to be Disinterred.
   - (o) Destruction of Forests.
   - (p) Dam Commission Requested of the Governor.
   - (q) Small-pox at Bunola, Allegheny county.
   - (r) Tuberculosis.
   - (s) Dumping of Garbage.
   - (t) Sanitary Arrangements in Construction of Railroads.

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1.—QUARANTINE.

(*a*)—THE FOLLOWING REGULATION WAS ADOPTED AT THE REGULAR MEETING OF THE BOARD HELD AT HARRISBURG, NOVEMBER 10, 1892.

Regulation VII.

Whenever the Secretary shall have satisfactory information that any of the following diseases, viz: Small-pox, varioloid, scarlet fever, diphtheria, yellow fever, typhus fever or Asiatic cholera is epidemic, or threatens to become epidemic, in any city, borough, district or place having no local board of health, or in which the sanitary laws or regulations are inoperative, he shall have authority, as executive officer of the Board, to issue a proclamation, in the name of the Board, declaring such disease epidemic, and to order and enforce such measures in the way of quarantine, isolation of the sick, vaccination, disinfection, and the closure of schools, public and private, religious and secular, as in his judgment may be necessary to stamp out the infection.

(*b*)—ACTION OF BOARD OF HEALTH OF PHILADELPHIA, RELATING TO RAGS FROM FOREIGN PORTS.

OFFICE OF THE BOARD OF HEALTH, CITY HALL,
PHILADELPHIA, *August 16, 1892.*

BENJAMIN LEE, M. D., *Secretary of the State Board of Health:*

DEAR SIR: I am directed by the board of health to say, in reply to your communication of August 13th, that the enclosed resolutions explain the action under which the board acts.

Yours respectfully,
JOHN J. MCCAY,
Acting Chief Clerk.

Resolved, By the board of health of the city and port of Philadelphia, that hereafter no rags from foreign ports shall be permitted to land at the port of Philadelphia until they shall have been disinfected to the entire satisfaction of this board, either at this port or at the port from whence shipped.

Resolved, That rags collected in or brought from places where dangerous, contagious, or infectious disease prevails, shall be deemed suspicious, and be liable to be excluded from this port. That rags brought from other places must be accompanied with reliable evidence that they have been collected in places (naming the places) where no contagious or pestilential disease (such as cholera, small-pox, etc.) prevails.

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(c)—TRANSPORTATION OF BODIES DEAD FROM DIPHTHERIA. ORDER OF THE STATE BOARD OF HEALTH.

STATE BOARD OF HEALTH, EXECUTIVE OFFICE,
PHILADELPHIA, *December 10, 1891.*

To Local Boards in Pennsylvania, all State Boards of Health in United States, and to Railroad Companies in Pennsylvania:

SIR: I am instructed by the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, to transmit to you a copy of the following resolution, adopted at a regular meeting held at Harrisburg, November 13, 1891.

Resolved, That rule I, of the second subdivision of regulation IV, entitled "Regulation of Travel and Traffic," be amended by introducing the word "diphtheria" after the words "typhus fever," so that the rule shall read:

"The transportation of bodies of persons who shall have died from small-pox, Asiatic cholera, typhus fever, diphtheria or yellow fever, is strictly forbidden.

NOTE.—This action was taken in view of the fact that the transportation of bodies dead of diphtheria has, in several instances, propagated the contagion, and is in harmony with the State Boards of Health of Ohio and Iowa. It is expected that all local boards in Pennsylvania will modify their regulations accordingly.

From the Baltimore and Ohio Railroad Company.

BALTIMORE, *February 15, 1892.*

To Agents in Pennsylvania:

The State Board of Health of Pennsylvania has issued instructions positively forbidding the transportation of bodies of persons dead from diphtheria. You will, therefore, in the future absolutely refuse to receive for transportation the bodies of persons dead from this disease in or through the State of Pennsylvania.

The following information is received from the Secretary of the State Board of Health of Pennsylvania, and is herewith furnished for the information of all interested:

"In consequence of the failure of the Legislature of the State to establish boards of health outside of large cities, considerable embarrassment has arisen with regard to the signing of permits for the transportation of dead bodies. In order to meet this difficulty, and avoid unnecessary delays, the Board authorizes burgesses in all incorporated boroughs, and justices of the peace in all unincorporated places, to sign such permits, except in cases of contagious disease, or of disinterred bodies, when the signature of the Secretary of the Board of Health or health officer of the nearest city, or of the Secretary of the State Board

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of Health, with the affidavit of the undertaker that the body has been prepared in accordance with the regulations of this Board, will be required."

"This circular may be presented to any burgess or justice of the peace as warrant for his authority in the premises."

"Yours respectfully,

"(Signed) BENJAMIN LEE,

"*Secretary Pennsylvania State Board of Health.*"

1532 Pine street, Dec. 30, 1891.

Agents are requested to see that each undertaker and local board of health in his vicinity is furnished with copy of this circular, extra copies of which will be sent from this office if desired.

B. E. PEDDICORD,
General Baggage Agent.

From the Philadelphia and Reading Railroad Company.

OFFICE GENERAL SUPERINTENDENT,
PHILADELPHIA, *January 13, 1892.*

DR. BENJAMIN LEE, *Secretary State Board of Health, Philadelphia:*

DEAR SIR: I am in receipt of your letter of 30th ultimo enclosing copies of resolution relative to the transportation of bodies with diphtheria, and will be governed accordingly.

Yours truly,

I. A. SWEIGARD,
General Superintendent.

From the Addison and Pennsylvania and New York and North Pennsylvania Railway Companies.

GENERAL SUPERINTENDENT'S OFFICE,
ADDISON, N. Y., *November 28, 1892.*

BENJAMIN LEE, *Secretary State Board of Health:*

DEAR SIR: On the afternoon of November 25 I wired you for permission to move the body of Joseph Schwarzenbach through the State of Pennsylvania from Galeton to Addison. Mr. Schwarzenbach lived some miles from the railway, and his people were ignorant of the necessary course to take in order to get the body transported, consequently application was not made for permit until the day following his death. This morning I am in receipt of your telegram giving me authority. Now it seems to me that the law in regard to the transportation of bodies is very deficient, and that some local officer in the smaller places should be authorized to grant the necessary permission, for you can plainly see how difficult it would be to make any arrangements when it is so hard to obtain authority. Does not the State Board have some authority whereby they could create an office in an unincorporated bor-

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ough? If so I should like to have one on the south end of our line, say at Gaines or Galeton, Pa. Kindly give me your opinion in regard to this matter.

Respectfully,

FRANK M. BAKER.

The Pennsylvania Lines West of Pittsburg, Operated by the Pennsylvania Company and the Pittsburg, Cincinnati, Chicago and St. Louis Railway Company.

OFFICE OF THE GENERAL BAGGAGE AGENT,
PITTSBURG, PA., *January 20, 1992.*

To Agents in Pennsylvania:

The State Board of Health of Pennsylvania has issued instructions positively forbidding the transportation of bodies of persons dead from diphtheria. You will, therefore, in the future absolutely refuse to receive for transportation the bodies of persons dead from this disease in or through the State of Pennsylvania.

The following information is received from the Secretary of the State Board of Health of Pennsylvania, and is herewith furnished for the information of all interested:

"In consequence of the failure of the Legislature of the State to establish boards of health outside of large cities, considerable embarrassment has arisen with regard to the signing of permits for the transportation of dead bodies. In order to meet this difficulty and avoid unnecessary delays the Board authorizes burgesses in all incorporated boroughs, and justices of the peace in all unincorporated places to sign such permits except in cases of contagious disease or of disinterred bodies, when the signature of the Secretary of the Board of Health or health officer of the nearest city, or of the Secretary of the State Board of Health, with the affidavit of the undertaker, that the body has been prepared in accordance with the regulations of this Board, will be required."

"This circular may be presented to any burgess or justice of the peace as warrant for his authority in the premises."

"Yours respectfully,

"(Signed) BENJAMIN LEE,

"*Secretary Pennsylvania State Board of Health.*"

1532 Pine street, Dec. 30, 1891.

Agents are requested to see that each undertaker and local Board of Health in his vicinity is furnished with copy of this circular, extra copies of which will be sent from this office if desired.

R. R. BENTLEY,
General Baggage Agent.

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Dunkirk, Allegheny Valley and Pittsburg Railroad, N. Y. C. and H. R. Railroad Company Lessee—T 27.

DUNKIRK, N. Y., *January 18, 1892.*

To All Concerned:

I have received from the State Board of Health, Commonwealth of Pennsylvania, a copy of the following resolution adopted at Harrisburg November 13, 1891:

"*Resolved,* That rule one of the second subdivision of regulation four, entitled 'Regulation of Travel and Traffic,' be amended by introducing the word 'diphtheria' after the words 'typhus fever,' so that the rule shall read 'The transportation of bodies of persons who shall have died from small-pox, Asiatic cholera, typhus fever, diphtheria or fellow fever, is strictly forbidden.'"

You will be governed accordingly.

C. H. KETCHAM,
Superintendent.

Dunkirk, Allegheny Valley and Pittsburg Railroad, N. Y. C. and H. R. Railroad Company Lessee.

SUPERINTENDENT'S OFFICE—C. H. KETCHAM, SUPERINTENDENT.

DUNKIRK, N. Y., *January 18, 1892.*

BENJAMIN LEE, *Secretary and Executive Officer State Board of Health, Harrisburg, Pa.:*

DEAR SIR: In reply to yours of December 30, received this day, I herewith inclose a circular that I have issued to my agents and baggage masters.

Yours truly,
C. H. KETCHAM,
Superintendent.

(d.) Transportation of Bodies Dead From Membraneous Croup.

LETTER FROM A. N. CARTER, SECRETARY BOARD OF HEALTH, BALTIMORE.

HEALTH DEPARTMENT, BALTIMORE,
December 2, 1891,

BENJAMIN LEE, M. D., *Secretary Pennsylvania State Board of Health, 1532 Pine Street, Philadelphia, Pa.:*

DEAR SIR: This department is in receipt of a transit permit for the body of one Marie Rupp, aged five years; cause of death, "membranous croup, which is a non-contagious disease;" signed Jacob Halbach, Secretary Board of Health, 32 N. Duke street, Lancaster, Pa. I write to ask if your department classifies membranous croup as "non-conta-

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gious," or do you put it along with diphtheria, as departments are doing, and which course we always pursue. A reply will greatly oblige

Yours truly,

A. N. CARTER,
Secretary Board of Health.

REPLY OF THE SECRETARY.

December 5, 1891.

Mr. A. N. CARTER, *Secretary Board of Health, Baltimore, Md.:*

DEAR SIR: Your communication of the 2d instant stating that your department is in receipt of a transit permit for the body of one Marie Rupp, aged five years; cause of death, membranous croup, which is a non-contagious disease, is received.

I would say in reply that our Board two years ago classified membranous croup with diphtheria as a contagious disease, and notified all boards of health so to report it. You have my thanks for informing me of this occurrence, and I shall at once write to the Lancaster Board giving them the necessary instructions.

Yours very truly,

BENJAMIN LEE,
Secretary.

LETTER TO JACOB HALBACH BY THE SECRETARY.

December 5, 1891.

Mr. JACOB HALBACH, *Secretary Board of Health,*
32 North Duke Street, Lancaster, Pa.:

DEAR SIR: I have received a communication from the board of health of the city of Baltimore conveying the information that a body had been received in that city with a transit permit signed by yourself, stating that the cause of death was membranous croup, which is a non-contagious disease. Your board must have failed to receive the communication which I addressed to all boards of health in the State some two years since, notifying them that the State Board of Health had classified membranous croup with diphtheria as a contagious disease to be so reported by physicians and so treated in transportation. It is now my duty to notify you farther that at the last regular meeting of the Board held at Harrisburg, November 12th and 13th, a regulation was adopted that diphtheria should be classed with small-pox, typhus fever and other diseases of which the transportation of bodies deceased from such disease shall be entirely prohibited.

I, therefore, suggest that your board take early action in regard to both these matters. This is of more importance at the present time, not only because diphtheria is unusually prevalent in your city, but

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also because there appears to be a tendency to the spread of this contagion throughout the State at the present time.

Asking your early attention to this matter, I have the honor to be,

Yours respectfully,

_____

Secretary.

REPLY OF JACOB HALBACH, SECRETARY LANCASTER BOARD OF HEALTH.

HEALTH DEPARTMENT, CITY OF LANCASTER, PA.,

December 11, 1891.

BENJAMIN LEE, M. D., *Secretary State Board of Health:*

DEAR SIR: There has been an outrageous imposition perpetrated upon some of the residents of our county, and they have asked me if there is not a remedy, but having occurred in the county it is beyond our jurisdiction. Perhaps your Board can do something for them.

The facts are these. A man by the name of Hess, Isaac L., who lives a few miles from the city, had two children sick with malignant diphtheria. He and his family are believers in the faith cure, and he would not employ a physician. One of the children died several days ago, and they held a public funeral, and since then the other child died, and they held public funeral to-day at his house and at the church. Can such transactions be prohibited. Please let us know.

Yours truly,

JACOB HALBACH,

Secretary.

REPLY OF THE SECRETARY.

December 16, 1891.

Mr. JACOB HALBACH, *Secretary Board of Health, Lancaster, Pa.:*

DEAR SIR: Referring to your favor of the 11th instant, in which you inform me that public funerals have been held in the case of persons dead from malignant diphtheria in your county.

Up to the present time our Board has failed to induce the Legislature to pass any general law upon this subject. It has, therefore, fallen back upon its authority to pass resolutions to prevent the spread of contagious diseases, and adopted as its ground of action in such cases the Model Ordinance for cities and boroughs, of which I have already, I believe, sent you copies. I presume, however, that we cannot enforce it until it has been printed in a newspaper in every county town in the State, and with our limited appropriation it will be some time before we can afford this amount of advertising.

Yours very truly,

BENJAMIN LEE,

Secretary.

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(d). Cholera—Work at the Breakwater to Provide Against Cholera.

PHILADELPHIA, *September 4, 1892.*

WALTER WYMAN, *Supervising Surgeon General United States Marine Hospital Service:*

The State Board of Health of Pennsylvania earnestly urges that your department provide accommodations on shore for passengers and crews of vessels detained by the quarantine of the Delaware at the earliest possible moment, and, if necessary, that the government purchase an additional site for the purpose.

BENJAMIN LEE.

WASHINGTON, D. C., *September 7, 1892.*

Dr. BENJAMIN LEE, *Secretary State Board of Health:*

Work on barracks for eight hundred immigrants at Breakwater authorized. Completed in a short time.

WYMAN,
Surgeon General.

PROVISIONS AGAINST CHOLERA; ACTION TAKEN BY THE BOARD.

Telegram from H. I. Gourley, Mayor of Pittsburg:

September 15, 1892.

Dr. BENJAMIN LEE, *Secretary, etc.:*

What have you done toward establishing quarantine or inspection stations in our State? We are satisfied such stations should be established immediately east of our city line on all railroads. Will you locate these stations?

H. I. GOURLEY,
Mayor.

Reply of Secretary:

PHILADELPHIA, *September 15, 1892.*

Inspection stations of State Board will be on boundary line of State. Cities must establish their own stations at their boundary lines, if needed.

BENJAMIN LEE,
Secretary.

From Jas. Forker:

SHARON, *September 21, 1892.*

Dr. LEE, *Secretary, etc.:*

Ohio is quarantining against N. Y., P. & O. R. R. Have brought back two cars with ten persons and left them right in our midst. What is our recourse?

JAS. FORKER.

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Reply of Secretary:

PHILADELPHIA, *September 21, 1892.*

JAS. FORKER:

Pennsylvania Railroad Company responsible for support of persons detained. Have ordered Inspector Woods to take charge.

BENJAMIN LEE,
Secretary.

Order to Inspector Woods:

September 21

Dr. A. A. WOODS, *Medical Inspector, Erie:*

Visit Sharon, Mercer county, and arrange for quarantined passengers. Wire full statement of situation.

BENJAMIN LEE,
Secretary.

From Wyman, Surgeon General:

WASHINGTON, D. C., *September 12.*

Dr. B. LEE, *Secretary, etc.:*

Collector of Customs and Acting Assistant Surgeon at Erie instructed to aid State authorities by circular. Am not warranted in furnishing launch. Ports of entry: Philadelphia, Chester, Pittsburg and Erie.

WYMAN,
Surgeon General.

From Mayor of Pittsburg:

September 15.

Dr. B. LEE, *Secretary:*

In harmony with your telegram just received we will expect the State Board to establish an inspection station at or near Cumberland, on the B. & O. R. R. Answer.

H. I. GOURLEY.

Reply of Secretary:

September 15.

H. I. GOURLEY, *Mayor, etc.:*

Cumberland is one of the points we have decided to guard.

BENJAMIN LEE,
Secretary.

To Mayor of Pittsburg:

September 17.

H. I. GOURLEY:

I have placed inspector at Cumberland.

BENJAMIN LEE,
Secretary.

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To Inspector Hackney:

J. S. HACKNEY, *Cumberland, Md.:*

Train inspection suspended. Return home.

BENJAMIN LEE,
Secretary.

NOTICE TO BE SENT TO MEDICAL INSPECTORS.

DR. . . . . , *Medical Inspector*, ... *District:*

DEAR DOCTOR: Within your district are the following points on the State border at or near which it may become expedient to establish inspection stations, hospitals and camps of observation, in consequence of the threatened invasion of cholera, viz:

. . . . . .

. . . . . .

. . . . . , ... county, at which the . . . . . railroad enters the State, and the nearest important station to which across the border is . . . . . .

You are hereby instructed to at once confer with the officers of said road with reference to the most available locations for such stations, the most convenient points for instituting inspections of passengers, and the number of medical train inspectors which will be needed in order to insure the protection of the State and at the same time interfere as little as possible with the movement of trains and the convenience of the travelling public. In selecting points for camps you should have regard to isolation, facilities for drainage and water supply. You will also nominate to the Board such physicians of experience and good standing as in your judgment will be qualified to perform the duties of train inspectors.

Yours very truly,

. . . . . ,
Secretary.

NOTICE TO DEPUTY MEDICAL INSPECTORS.

DEAR SIR: If appointed by the State Board of Health, are you willing to accept the position of Deputy Inspector for the . . . district, including . . . . . , during the emergency caused by the threatened invasion of cholera, in order to aid in enforcing the regulations of the Board in your neighborhood? There is no emolument attached to the position. It is possible, however, that your fellow citizens might consider that your services deserved substantial recognition on their part.

Yours very truly,

(Signed) BENJAMIN LEE,
Secretary and Executive Officer.

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DUTIES OF DEPUTY INSPECTORS TO THE STATE BOARD OF HEALTH OF PENNSYLVANIA.

PHILADELPHIA, *September 19, 1892.*

Deputy Inspectors are appointed in order to meet the emergency now confronting this Board in view of the threatened invasion of cholera, and the entire absence of local health officers in this State, outside the limits of large cities and towns. Their duties are, therefore, those ordinarily appertaining to the position of a local health officer, as follows:

First. Should any incorporated borough exist within the limits of their respective districts, to notify the burgess and council of such borough that they are by law responsible for the protection of the health of the people, and that failure to carry out the instructions of the State Board of Health recently issued, for placing their towns in the best possible sanitary condition, will render them liable to impeachment and prosecution as officers, to a fine of one hundred dollars as individuals.

Second. In every village, to urge the residents thereof to unite in mass meeting and appoint the following committees, viz, a Finance Committee, a Sanitary Committee, and a Quarantine Committee. The Finance Committee to be charged with the duty of raising and disbursing funds; the Sanitary Committee with that of inspection, cleaning up, disinfecting and draining all streets, roads, alleys and commons, of inspecting private properties and insisting on similar steps being taken by their owners or occupants, and of establishing depots for disinfectants, and instructing the people in their use; and the Quarantine Committee, with that of inspecting all strangers arriving in the village, ascertaining whether they have come from infected places, keeping them under observation for five days, and, should signs of cholera appear among them, at once removing those attacked to some place already determined upon by the committee and there keeping them in strict quarantine with day and night guards, until the Deputy Inspector and attending physician pronounce them free from the danger of conveying the infection. Acting in conjunction with the county commissioners and poor directors they shall provide medical and nursing care and food for all persons thus detained.

Third. To make frequent personal inspection of their respective subdistricts, and especially of all places of which complaint shall be made to them, and in case such places shall, in their opinion, be in such condition as to endanger the public health, to declare the same nuisances and to order their abatement in the name of the State Board of Health, without waiting for further instructions; and in case the parties so notified refuse to obey such orders within a reasonable number of hours, to report their names with a full statement of the facts of the case to the Secretary of this Board in order that the district attorney may be in-

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structed to bring suit against the offenders in the name of the State.

Fourth. To make frequent report in writing to the Medical Inspector of the Board for the district in which their sub-districts may be situated, of the general sanitary condition of the same, of nuisances needing abatement and of nuisances abated and work done, and to give the Secretary of the Board immediate notice by telegraph of the occurrence of any case presenting the symptoms of cholera within their jurisdiction.

Fifth. To make themselves familiar with the model ordinance of the Board, and its circular on cholera, to distribute the same among the people, and in every way to instruct them as to their duties in maintaining their homes in a cleanly condition and destroying all germ nests and plague spots in or near the same.

BENJAMIN LEE, M. D.,
Secretary and Executive Officer.

Notice to Railroad Companies.

To the President and Board of Managers of the Companies:

GENTLEMEN: Allow me to call your attention to the enclosed Order and Circular of the State Board of Health and to the proclamation of His Excellency the Governor of the Commonwealth endorsing them.

You cannot too promptly inaugurate measures for complying with them, as cholera may at any moment slip through the sanitary cordon on the coast. The pecuniary loss which you would suffer, should it become epidemic, would infinitely outweigh the trifling expense of taking the prescribed precautions. The Board looks confidently for the same hearty co-operation on your part with its efforts to protect the public health which it has enjoyed on previous occasions of less urgency and gravity.

I have the honor to be gentlemen, yours with great respect,

Secretary and Executive Officer.

September 5, 1892.

Notice to Superintendents of Railroad Companies.

To the Superintendents of the Railroad Companies:

DEAR SIR: I have to request that you will inform me what steps your company has taken up to the present time in compliance with the several instructions and suggestions contained in the circular of the Board, transmitted to you September 5th instant.

Any other points with regard to sanitary precautions taken by you, and any practical suggestions which may have occurred to you on such points will be received with interest and carefully considered.

Yours respectfully,
(Signed) BENJAMIN LEE,
Secretary and Executive Officer.

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Health Department, City of Erie.

ERIE, PA., *September 22, 1892.*

BENJAMIN LEE, *Secretary State Board of Health, Philadelphia:*

DEAR SIR: I visited Sharon according to your order. I found twelve emigrants had been sent back from the Ohio line. The city of Sharon was feeding them but guarding them in the cars. All were well. Several had been in this country two or three months, but had no certificates from the quarantine authorities. This morning they were passed on through Ohio to their destination. I would suggest that you appoint Drs. Kibler and H. W. Thayer, both of Corry, as deputy inspectors at that point, of the trains on the New York, Pennsylvania and Ohio railroad. Also I would suggest that you notify the above road and the L. S. & M. S., and the Nickel Plate roads that their trains will be inspected at Erie and at Corry; that emigrants without clean bills will be sent back over the State line. There is, I fear, a bad condition as to small-pox at New Castle, Lawrence county. I suppose the inspector for that district has it in charge. A physician at Sharon told me that a great many children have been exposed. I did not go to New Castle, of course, but would like to know what quarantine arrangements have been made there against the small-pox since the town is on a straight railroad line with Erie.

I have asked the Governor to send us twenty militia tents with cots and matresses in case we should need them. They could be shipped here and simply kept in store and returned if not used. I would like to hear from you as soon as convenient on the cholera situation and your wishes in detail regarding railroad quarantine. I see by the paper that the State Board of Ohio and the local officers at Cleveland are in conflict regarding the extreme measures taken by the city of Cleveland.

Very obediently yours,

A. A. WOODS,

Health Officer and Inspector.

REPORT OF INSPECTION AT CUMBERLAND, MD.

By J. H. HACKNEY, *Medical Inspector*, on account of immigrants from cholera districts.

September 26, 1892.

To the Secretary of the State Board of Health:

SIR: I have the honor to report that in compliance with instructions received from you September 16, 1892, I visited State line on September 16th and found the following conditions to exist:

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Being instructed to inspect the certificates of inspection and disinfection of all immigrants from cholera infected districts, and to prevent all who were in any way suspected of either having cholera or had not passed through the necessary quarantine from entering the borders of the State of Pennsylvania. I established my headquarters at Cumberland, Md., six miles from the State line. At this point all trains on the B. & O. R. R. stop to change engines, crews, etc., and the railroad having an immigrant house for the accommodation of immigrants, it afforded me ample opportunity to make the proper inspections. During my stay there I inspected eleven immigrants, from the ships Dresden and Nevada, ten of whom were bound for Pittsburg, and one for Connellsville, Pa. All having the proper certificates and being in a healthy condition they were allowed to pass, after being countersigned.

Very respectfully submitted,

J. H. HACKNEY, M. D.,
Inspector.

ACTION TAKEN BY THE AUTHORITIES OF HUNTINGDON, HUNTINGDON COUNTY.

Cholera!—Sanitary Notice.

We, as citizens of the borough of Huntingdon, have been officially commanded by the State Board of Health to at once put our houses and premises in the best of order, in the anticipation of the spreading of an epidemic of cholera.

The passengers on the ships on which cholera has made its appearance are now being released, and are scattering over the country.

Our connection with New York is direct, and any passenger on the many trains may bring this pestilence.

Preparatory to a house-to-house inspection, I hereby notify all citizens, owners and tenants, to give immediate attention to the following:

1st. Clean out your cellars, ventilate them well, and white-wash everywhere possible. Give especial attention to the cellar drains.

2d. Examine all water-closets, sinks, pig pens and stables, and remove everything objectionable.

3d. Have all the grass and dirt removed from all street and alley gutters. Don't throw this into the street, but have it taken away or buried. Weeds and grass accumulate and hold filth, making a very common but serious nuisance.

4th. White-wash all your out buildings, dark corners, fences, etc.

5th. When all this has been done use disinfectants liberally, viz: Lime, copperas water and chloride of lime for cellars, drains, etc. They are

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all cheap. Spent gas house lime and common lime for water-closets and dirty corners, and diluted carbolic acid and copperas water for open drains and gutters.

Every citizen owes it to himself and his neighbor to cheerfully, thoroughly and promptly attend to this command from the State Board of Health, and it is hoped that the house-to-house inspection which it is proposed will be made without delay will find but few cases of complaint that require more vigorous action.

J. C. BLAIR,
Burgess.

September 20, 1892.

REPORT OF THE QUARANTINE COMMISSION ON THE DEFENCES AGAINST CHOLERA ALONG THE DELAWARE BASIN.

The Quarantine Commission of the International Conference of State Boards of Health visited the stations of the Delaware basin on September 13th and 14th, and at the request of the State Board of Health of Pennsylvania and the board of health of Philadelphia, make the following preliminary report:

The important points involved in the protections of the Delaware basin are: First, the Government quarantine station at the Delaware Breakwater, one hundred miles below Philadelphia; second, the port quarantine station, or Lazaretto of Philadelphia, and third, the various local health authorities along the river.

1. The Delaware Breakwater Station consists of a large administration building and residences for the officers, a small hospital of twenty-eight beds, tents for persons under observation and dining hall for their use, and two or three smaller buildings for bath and cleansing purposes.

The hospital was not in good condition for the reception of patients, and the water supply is drawn from a shallow pipe well driven into the sand under the hospital building. The attached kitchen obtains its water supply from a similar well under the building. The bath room has no proper conveniences, ordinary tubes being used while no adequate water supply is readily available. There are no water closets and the privies are objectionable. The station consists of a part of main shore of about twelve hundred feet square, and persons under observation could be quarantined only by sentries detailed for the work.

A mile outside and in front of the station is a Government breakwater, with enough water inside it for ships and schooners, but heavy

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draught vessels have to lie in the exposed offing at a point where the bay is twelve miles across, and exposed to the violence of storms from the ocean.

For boarding these vessels there is a revenue cutter and a smaller vessel, the "Pasteur," the latter fitted up with sulphur dioxide furnace and a tank with disinfecting solutions for use in disinfecting ships and cargo. At the time of the visit this vessel was out of repair and not available for use, and at any time when the water is rough it cannot be used alongside of ships anchored outside.

To the west of the breakwater is an iron pier having from 20 to 25 feet of water. This pier could be utilized for placing thereon a disinfecting plant for use in small vessels. For larger vessels, baggage and effects would have to be brought for disinfection to the pier in a "lighter." The pier is not on the quarantine grounds and is not available for present use, the War Department having jurisdiction. At present the vessels, as the "Ohio," are detained in the offing, and baggage, ship and cargo are disinfected only by the ship's steam. This is to be supplemented shortly by a barge now at Philadelphia which is fitted up with a steam disinfecting chamber for baggage. The chamber is well calculated for the work, but the commission fears that the barge cannot be made available for use alongside vessels in rough weather. Owing to the exposed condition of the anchorage, and the impossibility of a deep water wharf being constructed, the commission does not consider the station as being well chosen since it cannot be made available at all times for rapid and effective work.

2. The Philadelphia quarantine station or Lazaretto situated eight miles below the city on a shore of made land, thoroughly under-drained. The main building was begun in 1799. The tract, enclosed with a high fence, consists of ten acres with an adjoining ten acres of government land at the disposal of the authorities. Buildings have sprung up as residences on land adjoining the station, and hence it is desirable that a new island station in the river be secured. This is, fortunately, present in mid-channel just opposite the present station. The island is ample in extent, and without great expense can be made as dry and healthful as the present station. With the exception of the proximity to residences, rendering constant surveillance of "suspects" detained there necessary, the Lazaretto seems equipped to a degree, greatly exceeding that or any other station visited, for the treatment of the sick, the isolation of "suspects," and for the disinfection of baggage and other effects.

As yet the disinfection of vessels and cargo is not provided for except by the ordinary method by ship's steam.

The station proper has an administration building and residence for stewards, etc., a large kitchen, and contains also six large well-appointed wards to be used in emergency for the sick, and at other times for hous-

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ing persons under observation. Everything in this building is regulated with that care seen in first-class city hospitals. Some two hundred yards from this is the hospital now used, which is well fitted up and has kitchen, wash room, etc., and capacity for forty patients. There is also another small building used in part as a disinfecting chamber by boiling water and sulphur and chlorine fumigations, and in part as morgue.

At the shore is a small boat-house with a barge for boarding, in case the steamer becomes temporarily disabled.

Along the shore to the right is a newly completed steam disinfecting room sixteen feet square, boiler attached. A temperature of 216° F. is obtained, while with contemplated improvements a higher degree may be possible. This was constructed within a week and must be considered as a temporary substitute for a steel disinfecting plant.

A large stone warehouse belonging to the government is also utilized by means of pots, for sulphur fumigation, the baggage being placed in wire baskets, several hundreds of which are on hand. The water supply of the station is excellent, being obtained by an artesian well three hundred feet deep, in an isolated position and is pumped to an iron tank at the top of the building. Some fifteen hundred gallons can be pumped hourly, and pipes are laid to all points, and water under pressure for fire and all other uses, is always available. The pumping is done by hot air engine. The bath-tubs, water closets and sinks, all of modern pattern, are supplied in ample number and are conducted to a carefully constructed system of sewerage. Large grass plots are available for the erection of tents, several hundred of which are on hand. For inspection purposes the station is supplied with a small steamer on which the Lazaretto physician visits vessels, whose arrival in the river is telegraphed up from the station of the maritime exchange at the breakwater.

For cases where quarantine of detention and disinfection is deemed necessary, the station has just been provided with a so-called "Observation" steamer, the "Georgiana," having accommodation in staterooms and temporary berths fitted up in the cabin for some five hundred persons. This vessel will run alongside of steamers and have removed to it steerage passengers, who though healthy may have been exposed to cholera on the voyage. They are to be detained during the incubation period of the disease and close observation by the physician in charge will be kept up and any sick will be removed therefrom to the hospital. While housing so many in such close quarters is not desirable, yet the scientific methods, which have been adopted to obviate any evil results arising therefrom are most elaborate and complete. These consist of a room fifteen feet square in the hold, fitted up with steam supply pipes for both dry and live steam, which can quickly, under pressure, be brought to the temperature of 230° F. Into this the

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wearing apparel of suspects is at once taken on their coming on board and disinfected, and returned to them after each has been bathed in hot water with disinfectants. The bath water can also be boiled in tanks. Two small fans operated by steam are being placed in position for the enforced ventilation of sleeping apartments and for the removal of the steam from the disinfecting chamber. Either side of the vessel is fitted up with bath rooms and, allowing fifteen minutes to each, some seventy-five persons per hour can be bathed, they being brought off from the ship in detachments as fast as they can be washed and their clothing disinfected. By this method of removal from the ship a minimum of infection will reach the observation vessel.

The most modern appliances for filtration and sterilization of drinking water have been fitted up, and are known as the "West" apparatus. By it river or other water is pumped into a reserve tank of 150 gallon capacity, whence it is under pressure forced through a new charcoal filter, after which it passes into a sterilizer, which is a small steel cylinder so constructed that by an automatic mercury valve arrangement the water is subjected in an inner galvanized tube to steam at 230° F., or higher if necessary, and thence with its contained gasses, passed on through galvanized iron pipe cooled in coils placed in the deck water-tank and thereafter drunk from faucets in the protected refrigerator ice boxes. Either side of the vessel is fitted up with separate latrines and urinals. The latrines are of modern make and supplied with a disinfecting solution, all excreta being subjected to it. These rooms are under the constant supervision of attendants, instructed to observe any evidence of diarrhœa in "suspects." The kitchen is supplied with three large steam cookers, suited for the work, while steam-heated water is laid on for washing dishes, etc. Pipes are laid and 200 feet of hose supplied, so that decks can be steam-washed, as also the holds of infected vessels. An electric lighting plant is supplied over the whole ship.

3. The city organization of health for Philadelphia is established on a broad basis as a department under the Director of Public Safety. As the director has under him other departments as police, fire, etc., he is situated peculiarly well for supplying special aid, in times of emergency as the present, to the health bureau, by utilizing the police and officers of other services. The service at present consists of the mayor and Director of Public Safety, both of whom are *ex-officio*, members of the board of health, which is made up with five additional members appointed by the mayor. The board meets daily part of the year and receives reports and gives direction to the sub-heads who are under the general direction of the health officers and medical inspector. There are also nineteen assistant medical inspectors, twenty-four nuisance inspectors under a chief, the disinfecting corps under a chief. The executive officer of the board is the health officer appointed by the Governor. In addition to these the director has detailed the whole police force,

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some two thousand men in all, to act as sanitary inspectors in the twenty-nine precincts.

In addition to this organization the board has its isolation or municipal hospital of some 200 beds, situated at a point in the city convenient of access. Notification of contagious disease is compulsory, and the board can isolate in hospitals all dangerous cases. The Lazaretto or port quarantine station, with its staff, is a branch of this city health service, and is placed under a committee of the board of health, being connected with the health office by telephone, and as closely scrutinized as if in the city.

While the value of any system for public health work must be judged wholly by results, yet it is proper to say that the commission is cognizant of practical results in various directions, which attest in some degree to the quality of the Philadelphia health service. Its plans are based upon a comprehension of the broad principles of sanitation, and these principles are being carried into effect through the adoption of scientific methods in details. The prompt concentration of forces to defend immediately vulnerable points, and a homogeneous organization operated by a capable general director, are visible on every hand. It is with much pleasure that the commission is enabled to say, after careful inquiry, that to Philadelphia at least the continent may confidently look for protection against the importation of cholera, so far as she can control its entry, by way of the Delaware basin, and for limiting its spread within her own borders, should it unfortunately find its way into the city through other channels.

As additional equipments to the station the commission would summarize its needs, already incidentally referred to, as follows:

(*a*) The immediate purchase of the island adjacent to the station, or any other equally suitable and available, to be fitted up as a permanent quarantine station, not only for Philadelphia but the whole Delaware basin.

(*b*) That this permanent station be supplied with a deep water wharf on which sulphur dioxide disinfecting furnaces, elevated tanks for disinfecting solutions, steel cylinders for disinfecting by super-heated steam, and any other necessary appliances may be placed for disinfecting ships and their contents, the ship being brought alongside the wharf.

(*c*) That as soon as the island be properly reclaimed and drained, commodious buildings for hospital purposes, and for the detention of "suspects" from ships, be constructed.

(*d*) That the present station be maintained as officers' quarters and a supply station.

(*e*) That in view of immediate necessities, the commission suggests that the Marine Hospital Service be requested to station the disinfecting steamer "Pasteur" near the Lazaretto, so that ships may be treated

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by sulphur dioxide disinfection during all weather. The commission was:

Dr. J. N. McCORMICK,
President, Bowling Green, Kentucky.
Dr. P. H. BRYCE,
Toronto, Canada.
Dr. HENRY B. BAKER,
Lansing, Michigan.
Dr. IRVING A. WATSON,
Concord, New Hampshire.

THE ESTABLISHMENT OF A NATIONAL QUARANTINE STATION NEAR NEW YORK HARBOR.

REVENUE MARINE STEAMER "U. S. GRANT,"
OFF CAMP LOW, NEW JERSEY,
September 20, 1892.

The HON. CHARLES FOSTER, *Secretary of the Treasury, Washington:*

SIR: I have the honor to report the establishment, according to your orders, of the National Quarantine Station, "Camp Low," on the government reservation at Sandy Hook.

Raison D'Etre.

The reason for the existence for this establishment was the presence in New York harbor of several vessels infected with Asiatic cholera, having on board a very large number of passengers exposed to the danger of infection, and for whom the provisions made by the health authorities of the State of New York were entirely inadequate. In particular, the passengers from the steamer "Normania," of the Hamburg-American line, were in quarantine for several days, and each day members of the crew were taken sick with cholera. These passengers being detained on board, were constantly subjected, on the one hand, to the terrors of Asiatic cholera, and the hardships of rigorous confinement on the other. Although detained in quarantine, these passengers, most of them American citizens, managed to communicate their unfortunate condition to the public, and American sympathy, always responsive to human suffering, was quick to heed. The government undertook to supply the deficiencies of the local quarantine at New York, and by your direction I examined the New York quarantine stations at Hoffman's and Swinburne's Islands, and found that Hoffman's Island, the only station to which persons from infected vessels could be removed, was crowded with detained emigrants; that no more could be accommodated, and that no provisions whatever had been made for cabin passengers. More than 10,000 steerage from European ports infected with Asiatic cholera were either on their way or were booked for passage, and ships recently arrived had lost many on the voyage. Under the stress of this menace

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the government had no alternative, and by your further direction, I next inquired what measures of precaution could be undertaken by the government to aid the State of New York in what threatened to become one of the most calamitous years of the Republic, in averting the prospective invasion.

You placed the U. S. revenue steamer "Grant," Capt. Thos. S. Smyth, at my disposal, and her officers rendered most valuable co-operation. In examining New York bay and vicinage, in company with Medical Director Gihon, U. S. Navy, and Dr. John H. Rauch, it was seen that Horseshoe Cove, off Sandy Hook, afforded a perfect anchorage for vessels, and the land opposite being a government reservation, and no important village or settlement near, afforded an eligible site on which to establish a quarantine camp, at once easy of access and easy to guard. Fortunately, the old wharf of the New Jersey Central railroad, on which was built a warehouse, was in an excellent state of preservation, and in such condition that it could be easily made the initial point for the new buildings, on which the location of the proposed camp can be seen.

The Construction of the Camp.

On Friday, September 9, 1892, the steamer "Grant" anchored in Horseshoe Cove, and with Lieutenant Levis and the ship's carpenter, U. S. R. M., measurements of the wharf and buildings were taken. That evening you accepted the proposal of Mr. Austin Corbin, president of the Long Island railroad, to build the necessary buildings according to my suggestions. That night I spent in writing memorandum requisitions for supplies, and the next morning a force of 150 carpenters, under the direction of Mr. C. M. Jacobs, C. E., and Mr. Cummings, were on the ground, and the buildings were erected with surprising rapidity. These comprised a large dining hall, with a capacity of seating 500 persons, a store room for the commissariat, a kitchen, three pavilions, a telegraph office, a baggage room, a hospital, a laundry, a building for the dynamo, surgeon commandant's office, quarters for the correspondents. The railway tracks between the pavilions were of great use, not only in the construction of the camp, but afterwards in its administrative functions. Over 400,000 feet of lumber were used in the construction of the buildings, and they were completed on Saturday morning, September 17.

The dimensions of the buildings were as follows:

Pavilion A, ...	18x343 feet.	
Apartments, ...	South 47 feet.	
	North 47 feet.	Total, 94 rooms.
Pavilion B, ...	13x313 feet.	
Apartments, ...	48 single.	
Pavilion C, ...	16x330 feet.	
Apartments, ...	South 44 feet.	

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North 23 feet. Total, 67 rooms.

Making a total of 209 state rooms.

Telegraph office, ...	13x25 feet.
Press office, ...	10x40 and kitchen 10x13 feet.
Laundry building, ...	13x64 feet.
Dining hall, ...	36x96 feet.
Electric light building, ...	12x28 feet.
Baggage room, ...	36x60 feet.
Commissary building, ...	18x36 feet.
Pantry and kitchen, ...	27x35 feet; extra kitchen, 12x23 feet.
Surgeon commandant's room, . .	13x30 feet.

In addition to the foregoing there were 3,006 feet of sidewalk laid, 4 water closets made, 58 latrines built, 100 tent floors, 12x14, and 200 tent floors, 10x12 feet, were made ready to be placed in position.

On Sunday, September 11, 400 wall tents, previously shipped by the War Department, were set up by the United States artillery from Fort Hamilton by order of Major General O. O. Howard, and speedy provision was made for the early occupancy of the camp.

After the rush of construction was over a few carpenters were retained to extend the pavilions. By this means it was intended to do away with the necessity for many tents.

Water Supply.

Abundance of fresh water is obtained on the Hook by driven well, and the old railway tank was utilized as a source of pressure, and water was piped to the various buildings.

Machinery.

Mr. Corbin caused the electric light plant formerly used at Rockaway Beach to be removed and put in position, and after the third night the work of construction was carried on at night by its aid. This has since been used for lighting the camp. A steam pump was placed at the old tank house to keep up the supply of water in the tank, and another pump was placed near the dynamo on the wharf and supplied with 500 feet of hose, with sea water connection, to be used in case of fire. I made a contract with the Troy Laundry Company, of New York, to furnish and place in position ready for running a laundry plant capable of washing for 500 persons a day. This machinery comprised stationary tubs, an engine, two washing machines, a centrifugal wringer, a mangle and drying racks. This was completed according to contract within forty-eight hours, by the men working night and day.

Latrines.

In a camp intended to contain suspects from ships infected with the Asiatic cholera, the construction of the latrines and their subsequent

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management are points of the first importance, for as is well known, the surveillance of persons suspected of cholera must include a watch of the frequency of their bowel movements. In the plan which was finally adopted, I availed myself of the advice of my friend, Lt. Col. Geo. M. Sternberg, Surgeon U. S. Army, and a delegation from a Committee of the New York Academy of Medicine, consisting of Drs. Loomis, Stephen Smith, Jacobi, Janeway and Allen McLane Hamilton. It was urged by Dr. Jacobi that the use of earth closets or chambers in the state rooms would make it impossible to ascertain quickly what person in the camp was suffering from diarrhœa, a point which only needed to be stated to be self-evident; therefore latrines were constructed in such a way that the dejecta was received into a pail, and the little houses themselves placed between the rows of corridors and tents in such a position that the patrolman could easily keep them under observation.

Galvanized iron pails of a capacity of two gallons were provided to receive the dejecta, and milk of lime was ladled into these pails by the patrolmen, who were instructed to systematically inspect them while on their beat. At the same time they were instructed to report to office any person making the second trip to the latrine from his state room or tent. Other attendants were directed to mop the seats twice a day with bichloride of mercury solution.

Hospital.

The hospital was constructed in more careful finish than the barracks and was intended for persons falling sick or being injured while in camp. Cholera patients, when found, were removed to and kept in tents near the hospital and isolated from the remainder of the camp.

Patrol.

To prevent straying of the detained persons, the Honorable Secretary of the Navy directed the detail of 211 marines under the command of Major Huntington, who drew a complete cordon sanitaire at a safe distance from the camp and maintained a regular patrol. This arduous duty, necessary for this temporary camp, which involved considerable hardship upon the officers and men of Major Huntington's command, could readily be obviated if the government shall finally conclude to establish a permanent station, by the erection of a brick wall and the dredging of an inner moat.

Sea Patrol.

The sea patrol was a matter of much less difficulty, and, for the first few days, was performed by the steamer "Grant," Capt. Thos. S. Smyth, which officer also detailed Chief Engineer F. H. Pulsifer to aid in mak-

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ing his first purchases, and in various other ways aided in the construction of the camp. The Hon. B. F. Tracy, Secretary of the Navy, detailed the Monitor "Nantucket," Captain Book, with two steam launches to continue the sea patrol and relieve the "Grant."

The Executive Force.

At first I was the only officer, but when the camp commenced to receive refugees turned over by the health officer of New York, the force consisted of myself as Surgeon Commandant of the camp, Surgeon W. H. H. Hutton, M. H. S., Passed Assistant Surgeons Wasdin and Stoner and Hospital Stewards Rœhrig and Stearns. At my earnest solicitation the veteran sanitarian, John H. Rauch, M. D., consented to remain as sanitary adviser and cholera expert. The remainder of the force consisted of cooks, carpenters, one plumber and about forty-five laborers. These were employed in continuing the barrack extension and policing the camp. At first we were short-handed and attempted the employment of refugees, but it was found that they could neither be kept at work, nor could they be made efficient. Ten sailors uniformed were therefore engaged as an additional force and were employed exclusively in sanitary work. My experience has shown that sailors are better disciplined and can be kept on such duty much better than the ordinary laborers. Mr. Nimmo, an interpreter and medical student, was made the foreman of the disinfecting corps. It was from the first deemed necessary to have female attendants to look after the welfare of the female refugees, and perform such other duties as might be required of them, and Mrs. Dunkinson, of Geneva, New York, was given supervision of their duties. Surgeon Henry W. Sawtelle relieved Surgeon Hutton, and I turned over the command of the camp to him September 22, 1892.

Aeration.

It is well known that aeration is one of the most effective means of disinfection, and for that purpose 2,000 feet of clothes line was placed in position to enable refugees to aerate their baggage.

Supplies.

The first supplies for the camp were received by the New Jersey Central railroad, but the local health authorities of New Jersey threw such obstacles in the way of trains as to make it impossible to obtain supplies with regularity or certainty. The steam tug "Talisman," Capt. C. H. Winette, was chartered, to be entirely at the service of the commanding officer of the camp, and make such trips to New York city as should be deemed desirable. Lieut. Wm. J. Herring, U. S. R. M., of the Str. "Chandler," whose headquarters were near the barge office, kindly consented to purchase miscellaneous supplies, and this officer is entitled to the highest commendation for the faithfulness with which he performed this extra duty.

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General.

Should the government at any time take this for a permanent station a wall directly across the Hook to the Atlantic, marking the east and west boundaries of the quarantine, would not only obviate the necessity of a military guard, but would allow persons detained to go through the cedar grove back of the camp, and thus add materially to their facilities for recreation while undergoing detention.

The barracks could be weatherboarded and plastered and heated by steam when necessary. A crematory should be built in the vicinity of the hospital. No isolation ward is necessary, as tents with flies, properly floored and heated by stoves, are better managed than isolation wards, which with every precaution are likely to themselves become centers of infection.

It is obvious that the establishment of this camp met a necessity arising from the great number of immigrants from infected ports massed in the harbor of New York; without it great hardship and greater loss of life must have inevitably resulted, not only among the unfortunate immigrants, but in cities and towns near by as well as those remote from New York. The officers engaged in the work have entered upon it with great public spirit, fully imbued with the intention, at whatever risk to themselves, to spare no effort in protecting the country against a great calamity, and I am safe in predicting the final report of the Surgeon Commandant will show the superiority of National methods in which the whole country have an interested voice, over those which formerly obtained.

There is no question of the power of Congress to legislate in the matter of National quarantines, and it is no argument against the exercise of that power to show that heretofore Congress has only undertaken to supply the deficiencies of State quarantines. Congress has not formally relinquished its power, nor could it do so; it has only failed to use it. When a fringe of States along the Atlantic seaboard comprised almost the whole of the United States, the necessities were different from the present conditions, when the center of population has been removed to the Mississippi Valley. It is inconceivable that one State alone should continue to conduct protective measures, according to its own methods, without regard to the wishes of other States, when all have common interests and are mutually inter-dependent.

But even more than economical considerations or convenient administration is the great relief to those poor suffering people, huddled together on a ship lying at anchor. They have nothing to fear more deadly than the fatal "crowd poison." Close quarters at sea may be made endurable by the forced ventilation, but lying at anchor the steerage air soon becomes stagnant and poisonous.

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(e.)—International Notification of Disease.

MEXICO, MEX., *December 12, 1891.*

GENTLEMEN: The system of inter-state and inter-provincial notification of contagious and infectious diseases has been in practical operation in the United States and Canada for several years, and to the great advantage of the health authorities of these countries. Believing that the system should be still further extended upon this continent I recently had the honor of personally presenting the subject to the National Board of Health of the Republic of Mexico, and this most active, efficient and accomplished board expresses its willingness and desire to co-operate with the health authorities of the United States and Canada to the extent of its ability in the suppression of contagious and infectious diseases, and to that end will hereafter promptly notify your board of the outbreak or existence of such diseases in the federal district of Mexico, at all the Mexican ports and along the frontier between Mexico and the United States. Beyond this the State authorities have control in these matters, and in order to extend this system of notification to these States, the National Board of Health will ask the Governors of the several States to request that such notification be promptly made. I have the assurance that in a short time the system will embrace every State in Mexico.

I would, therefore, suggest that you promptly notify the "Superior Board of Health, Mexico, Mex.," of the outbreak in your State of either of the diseases subject to notification, and that board will do likewise

As soon as the several Mexican States shall have assented to the proposition, I shall take pleasure in forwarding to you the list with the proper addresses. It is a pleasure for me to add that Mexico is making great progress in matters relating to sanitation, and closer co-operation with her will most certainly enhance the public health interests of the whole continent.

Very truly yours,
IRVING A. WATSON,
Secretary American Public Health Association.

(f.) School Laws in Relation to Contagious Diseases.

Inquiry from Della Hartman, school teacher, Stewartstown, York county:

STEWARTSTOWN, PA., *December 15, 1891.*

The State Board of Health, Harrisburg, Pa.:

When scarlet fever is in a family, can the children of the same family, and who have not as yet had it attend school? I sent a boy home, from the above stated fact, and his father insisted, and not only insisted, but brought him back. Entire families are leaving the school. Now,

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what is the law as regards this? The school law, just mentions it, in a general way. Enclosed please find stamp for return reply.

Very respectfully,

DELLA HARTMAN,
Stewartstown, Pa.

REPLY OF THE SECRETARY.

December 17, 1891.

Miss Della Hartman, box 74, Stewartstown, Pa.:

Yours of the 15th inst., inquiring as to your right to send home a pupil coming from a house in which scarlet fever is present, is received, I would say in reply, first, that there is unfortunately no law in this State upon the subject. Every school board has the right, however, to make its own regulations in regard to such matters. If your own Board has adopted a rule of this kind, you need go no farther for your authority.

In view of the absence of legislative provision for this matter, however, the State Board of Health at its last meeting adopted a regulation forbidding the attendance of pupils on school under such circumstances. You will find the rule in section forty-six of the Model Ordinance which I send you. Section fifty provides a penalty of not less than three or more than twenty dollars for disobeying the rule. I would strongly urge that you should present this subject to your school board, and endeavor to persuade them to pass such a regulation themselves.

Be kind enough let me know to what law you refer to when you say, "The school law just mentions it in a general way."

Yours very truly,

BENJAMIN LEE,
Secretary.

BLANKS FOR SCHOOLS IN CASES OF CONTAGIOUS DISEASE.

Easton School District.

SUPERINTENDENT'S OFFICE,

. . . . . *189* . .,

. . . . . .

Teacher of . . . . . School No. . . . .

Room . . . ., ... Building.

The bearer . . . . . ., who, for sanitary reasons, has been denied the privilege of school attendance, is hereby re-admitted to school agreeably to the advice of the attending physician.

. . . . . .

Superintendent.

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Name of patients, ... aged, ...
Name of disease, ...
When a minor, names of parents, ...
Residence: No. . . . . , 1st Ward.
Names of those in this family attending school are as follows:
Pupil's name, ... Teacher's name, ...
" " . . . . . " " . . . . . .
" " . . . . . " " . . . . . .
" " . . . . . " " . . . . . .
" " . . . . . " " . . . . . .
Reported, ... Physician.
Residence: No. . . . . Street.

EPIDEMICS.

(a). Small-pox at Mt. Pleasant, Bucks County.

INSTRUCTIONS TO MEDICAL INSPECTOR ATKINSON.

STATE BOARD OF HEALTH,
EXECUTIVE OFFICE, 1532 PINE STREET,
PHILADELPHIA, *November 14, 1891.*

DR. WM. B. ATKINSON, *Medical Inspector Delaware District:*

SIR: In making your inspection at Point Pleasant your first step will be to see Dr. Cooper, if possible, then to visit the house and placard it after verifying the diagnosis. The more influential citizens should then be assembled and Sanitary, Finance and Quarantine Committees appointed. The Sanitary Committee will have charge of cleaning up and disinfecting throughout the town, and of vaccination. The State Board of Health will furnish virus, but can assume no other expenses. The Quarantine Committee will appoint day and night guards and allow no one to go in or out of the infected house except the physician. They will provide food and medicine at the expense of the village if the family of the patient or patients cannot afford it, for all quarantined persons who will make known their needs through a selected spokesman by word of mouth, no letter or other piece of paper being allowed to pass outside the lines.

A vacant house should be selected to which those exposed in the infected house but not sick can be removed for observation, only those necessary for the care of the patient remaining. Persons thus under observation should be detained eighteen (18) days. In case of one of them being taken sick with this disease, or any other person in the village being so taken sick, such person must be removed to the house

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in which the present case now is, which will be the quarantine hospital. If, however, there is a small-pox hospital connected with the county almshouse, it is the duty of the directors of the poor to have all new cases removed to that building and properly cared for at the expense of the county.

All persons known to have been exposed to the contagion must be vaccinated first, and later the entire population.

The Finance Committee will proceed at once to raise funds to meet the necessary expenses. If an additional case occurs it will be necessary to prepare a nurse. The physician will make no unnecessary visit within the lines, but will keep himself constantly informed by verbal communication with the nurse of the condition of the patient. After leaving the house he will make a complete change in his clothing and take a disinfectant bath before visiting any other patient.

The circular of the Board on precautions against small-pox should be placed in every family by the Sanitary Committee.

Until the Quarantine Committee have selected the guards you are authorized to assign the duty of watching the infected house to the town constable. The guards will wear the badge of the State Board of Health and are authorized to arrest and return to the infected house any person or persons endeavoring to escape therefrom, and to use such force as may be necessary to accomplish this object.

You will inform yourself of the distance of all neighboring towns and villages, and of the frequency of communication between them and Point Pleasant. You will immediately report to this office upon your return the number of persons sick, the probable number exposed, the number of inmates of the infected house, the population of the village, the names of railroads passing through or near it, and the number of persons vaccinated up to the present time.

Yours very truly,

BENJAMIN LEE,
Secretary.

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Inspection by W. B. Atkinson, M. D , Medical Inspector.

STATE BOARD OF HEALTH,
PHILADELPHIA, *November 16, 1891.*

Subject of complaint.—Case of small-pox at Point Pleasant, Bucks county.

Went to Point Pleasant this day, found that not one of the physicians had seen the case and hence knew nothing of the case save by heresay. Visited the house and found one Nicholas Ranni, aged 26 years, convalescent from varioloid, said to be in the fourteenth day of his illness, and to have come here from Trenton, N. J., nearly a week before. I could not learn from him as to any medical attendance, and he appeared not to have regarded it as necessary. I found in the house a man, Frank Carval, his wife, his two children, aged one and six years, and two other women. All assured me they had been vaccinated in Italy, and all showed good vaccine scars. The two children who were born here, I at once vaccinated, Tommy Carval, aged six years, Jimmy Carval, aged one year. I placarded the house and endeavored to make all understand that they must remain until the health officer of the place should grant permission to leave the premises. I found this a little difficult to enforce as they did not seem to understand why, and think the guards may have trouble. It appears that these people having been in the habit of indiscriminate visiting do not understand why they shall not continue it. They cross a bridge to the Jersey side into a station on the Belvidere division of the Pennsylvania railroad called Byram. There are no other inhabitants here than those belonging to the station. The neighboring villages are Carversville, distant 5 miles, with 165 inhabitants; Gardenville, 4 miles, 60 people; Lumberville, 2 miles, 250 people and a bridge across to Jersey side, where there is a small place; Plumsteadville, 6 miles, 150 people; Centre Bridge, 5 miles, 100 people; Centre Hill, 8 miles, 75 people; Lahaska, 9 miles, 150 people; Pipersville, 6 miles, 100 people; the bridge over the Delaware at Point Pleasant is 900 feet in length and much used, especially by these people to go to the quarries where they work.

In addition there are Centreville 7 miles away, with a population of 300; Mechanics' Valley, 9 miles, 75 population and Erwinna 5 miles, 100 population. There are no railroad lines nearer than the Pennsylvania as above at Byram. Traveling is done by stage or private conveyance, etc.

Doylestown on the Reading is 9 miles, population 3,000.

The people of the village met me in a hall and I explained what was to be done, got them to organize, with Dr. A. M. Cooper as chairman, and they agreed to all the plans which I proposed, and at once agreed to contribute to a fund to pay the expenses. Dr. Cooper appointed as the Sanitary Committee, Drs. T. H. Bishop, W. R. Cooper and himself, the other hcommittees he will send me. Everything is promised to be carried forward, and the vaccination to be performed by Dr. W. R. Cooper.

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I am informed that this disease prevails at Trenton, but could obtain no positive points. The Italians here, as elsewhere, are difficult to deal with as they know only force and yield obedience only through fear. The people of other nationalities regard them as dangerous not only from their filthy habits, but from their use of the secret mode of attack, and were anxious to know how far they could go in restraining their movements. Perhaps it would be well if you were to issue to some one authority, say the elder Cooper who is a man of strong good sense, and careful in his movements. He assured me that there was no kind of government for the place.

Appointment of Dr. A. M. Cooper, Deputy Medical Inspector.

STATE BOARD OF HEALTH.
HARRISBURG, *November 16, 1891.*

Dr. A. M. COOPER, *Point Pleasant:*

DEAR SIR: Your are hereby notified of your appointment as deputy medical inspector to the State Board of Health of Pennsylvania for the Tinicum sub-district, including the townships of Tinicum, Bedminster, Plumstead, Buckingham and Solebury, with full authority to enter upon and inspect all premises specifically referred to you by the Board for the purpose of determining whether the condition of said premises or of the inmates thereof is such as to threaten danger to the health of the inmates thereof or of the public.

By order of the Board.

BENJAMIN LEE,
Secretary and Executive Officer.

You are further impowered to arrest and quarantine suspected small-pox cases, and to quarantine infected houses.

Instructions to Deputy Inspector Cooper.

STATE BOARD OF HEALTH,
EXECUTIVE OFFICE,
PHILADELPHIA, *November 16, 1891.*

To Dr. A. M. COOPER, *Deputy Medical Inspector:*

SIR: You are hereby empowered and instructed to proceed, without unnecessary delay, to any house in your sub-district in Bucks county, and investigate the sanitary condition of said house as regards the suspected existence of small-pox or varioloid therein, to arrest and detain any person suspected of having this disease, to order vaccination and disinfection, and to appoint guards as needed, and to report to this office whether, in your opinion, the said existence of small-pox constitutes a nuisance, prejudicial to the public health; and if so, what further steps are necessary to be taken to abate the same.

By order of the Board.

BENJAMIN LEE.
Secretary and Executive Officer.

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COMMITTEES APPOINTED.

POINT PLEASANT, PA., *November 16, 1891.*

WM. B. ATKINSON, M. D.:

DEAR DOCTOR: Below you will find the names of the committees.

Sanitary.—Doctors J. H. Bishop, Wm. R. Cooper, A. M. Cooper.

Quarantine.—Ben. W. Young, Benjamin Haun, Irwin Nace, Charles Morris, Wiley Strouse.

Finance.—J. D. Walter, Solomon Fulmer and S. W. Seidy.

The house has been guarded well since, and no one has gone in or out except in case of necessity. The quarantine committee will add too as necessity requires.

Very respectfully yours,

A. M. COOPER.

POINT PLEASANT, PA., *November 16, 1891.*

WM. B. ATKINSON, M. D.:

DEAR DOCTOR: Since I wrote this a. m., the Italians have positively refused to be vaccinated. I mean those who live over the river in New Jersey. What shall be done with them? Also the Italians in one house who have been visiting the infected house, have gone to work this afternoon, contrary to promise. How shall I go about arresting them? They are just as dangerous as the other parties.

Yours, etc.,

A. M. COOPER.

Further Instructions to Dr. Cooper.

November 17, 1891.

DR. A. M. COOPER, *Pt. Pleasant, Bucks County, Pennsylvania:*

DEAR DOCTOR: Enclosed you will please find your commission as deputy medical inspector of the Tinicum sub-district, to continue in force until the danger of small-pox has disappeared. I would suggest that you make it generally known that general vaccination is ordered by the State Board of Health, that virus will be furnished free of expense to all physicians or other responsible persons desiring to use it, and even in cases where persons can show a good scar from vaccination in infancy urge the importance of revaccination. In reference to the extent of the use of force in arresting suspected persons, or others who have been quarantined, the same degree of force may be used as would be allowable in the arrest of a criminal. Such persons are a danger to the health and lives of the community to a greater degree than an intoxicated man with a loaded pistol in his hand, and while I would urge the avoidance of anything that could be condemned as brutality, I would not have you fear to instruct your agents to use such force as may be necessary to

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prevent the escape of such persons. It would be well for the guard or constable in case he suspects resistance, to obtain the aid of such a number of citizens as may at once overawe the individual. It would probably be also well in cases where time permits to swear out a warrant before a justice of the peace for the arrest or detention, or both, of such persons. I have communicated with the Secretary of the State Board of Health of New Jersey, Dr. E. M. Hunt, in order that he may take such measures as he deems necessary in regard to restricting communication between the two sides of the river. I shall be indebted to you if you will communicate with me not less frequently than every second day, informing me of the precise condition of affairs and of any difficulties that may confront you. The commissioners of your county are Ezekiel A. Groom, Henry Gill, and George A. Mahan. The poor directors are Benjamin Schuyler, John Johnson, and Alonzo Nicholas. I am not in possession of their postoffice addresses. They could probably be communicated with through the burgess of Doylestown, and I will address a communication to him on the subject. I shall instruct them on receiving information from you that another case of this disease has occurred, they shall immediately send for such person and remove him to the building provided for this purpose in connection with a county almshouse.

I enclose two more badges in case you find it necessary to use them.

Yours very truly,

BENJAMIN LEE,
Secretary.

Letter to Benjamin Schuyler, Chairman Board of Poor Directors of Bucks County.

November 17, 1891.

Mr. BENJAMIN SCHUYLER, *Chairman Board of Poor Directors of Bucks County:*

DEAR SIR: It is my duty to notify you of the occurrence of a case of small-pox at Pt. Pleasant, Tinicum township, in your county. This case has been strictly quarantined by the State Board of Health. Before such action was taken, however, opportunity occurred for other persons to become infected. Should other cases occur it will be your duty to at once remove them to the building provided for such cases in connection with your county almshouse.

I have commissioned Dr. A. M. Cooper, of Pt. Pleasant, Deputy Medical Inspector for Tinicum sub-district, including the townships of Tinicum, Bedminster, Plumstead, Buckingham and Solebury, and have

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instructed him to notify you immediately on the discovery of another case.

I have the honor to be,

Yours respectfully,

BENJAMIN LEE,

Secretary.

Letter to Ezekiel A. Groom, President of the Board of County Commissioners of Bucks County.

November 17, 1891.

Mr. EZEKIEL A. GROOM, *President of the Board of County Commissioners of Bucks County:*

DEAR SIR: It is my duty to notify you that a case of small-pox exists in your county, in the village of Pt. Pleasant, Tinicum township. This case has been strictly quarantined by the State Board of Health. Before this action was taken, however, opportunity occurred for the infection of many others. Should other cases occur I have instructed Dr. A. M. Cooper, of Pt. Pleasant, whom I have commissioned, as deputy medical inspector, to notify you immediately, and in such event I will request you to confer with the directors of the poor and have such person immediately removed to the building provided for such cases in connection with your county almshouse.

I have the honor to be,

Yours respectfully,

BENJAMIN LEE,

Secretary.

Letter to Chief Burgess of Doylestown.

November 17, 1891.

To the Chief Burgess of Doylestown, Doylestown, Bucks county, Pennsylvania:

DEAR SIR: You have been already informed by Medical Inspector Atkinson of this Board of the existence of a case of small-pox at Pt. Pleasant. I take the liberty of sending you a number of circulars of our Board which it would be well to distribute to physicians and public officers in your borough. I desire to communicate with the county commissioners and directors of the poor of your county, and although I have their names I have not their addresses, I will therefore request you to kindly forward the enclosed communications to the gentleman to whom they are addressed.

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It would be well for you to insert an official notice in the public papers calling the attention of your citizens to the importance of general vaccination.

I have the honor to be,

Yours respectfully,

BENJAMIN LEE,
Secretary.

Second Letter to Chief Burgess.

November 21, 1891.

To the Chief Burgess of Doylestown, Doylestown, Bucks county, Pennsylvania:

DEAR SIR: It is my duty to inform you that another case of small-pox has occurred at Pt. Pleasant. In view of this fact and of the probability of other persons having been infected, I take the liberty of renewing my suggestion that you should officially advise all citizens of Doylestown who are not fully protected to be vaccinated.

I enclose a letter to Benjamin Schuyler, chairman of the poor directors of Bucks county, which I will request you to forward to him and to notify me if he has received it.

Yours very truly,

BENJAMIN LEE,
Secretary.

Second Letter to B. Schuyler.

November 21, 1891.

Mr. BENJAMIN SCHUYLER, *Chairman of the Poor Directors of Bucks county:*

DEAR SIR: It is my duty to inform you that a second case of small-pox has occurred in Pt. Pleasant. This case is in the same house as the first case, and I have, therefore, ordered it to be kept in quarantine in that house. As I wrote you before, however, I have instructed Deputy Medical Inspector Cooper to notify you at once in case the disease appears in any other house so that you may at once remove it to the county small-pox hospital. I trust you will lose no time in having said hospital put into good habitable condition if it is not so already with proper provision for heating, cooking and nursing. Many persons were exposed before the State Board of Health received notification, and it is possible that you may have several cases to take care of.

Yours very truly,

BENJAMIN LEE,
Secretary.

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b. Typhoid fever at Greencastle.

November 4, 1891.

To the Burgess and Town Council of the Borough of Greencastle:

DEAR SIRS: After a careful inspection of the sanitary condition of your borough, and a meeting of citizens at which the subject of sanitation was discussed and information obtained, I beg leave to call your attention to the following considerations:

First. It is not in harmony with the well known laws of health, that you should continue the open canal of water in your borough, as it has been and is now kept, and, therefore, I am under the necessity of pronouncing it a nuisance prejudicial to public health.

Second. The existence of typhoid fever and continued fever to the extent of sixty cases at least in your borough, during the last six months, clearly points to polluted well water as a chief cause; and as you have ten closed wells which are known to be polluted and thirty-four others which are open, I have no hesitation in stating that a large proportion of the latter are also polluted, and that these constitute an other nuisance also prejudicial to public health. The rocky stratum upon which your town is built, the high water level and the proximity of the wells to five graveyards and many neglected privies and stables, make a clear case of water pollution.

Third. Until you receive further instruction from the executive officer of the State Board of Health, you are hereby directed, either as a council or as members of a gas and water company, to take such steps as will secure to the people of your borough an abundance of pure, potable water. For this purpose it is suggested that you lay a metal pipe sufficiently large from the head of Moss Spring into the borough and along Washington street, with smaller pipes down Franklin, Baltimore and Madison streets, with hydrants at the curbstones or elsewhere, as the case may be.

Fourth. In the meantime you are directed to close all suspected wells, and such as may be condemed after an analysis of the water; that you forbid the interment of the dead in your borough; that you purchase an odorless excavator, to be under the control of the sanitary committee of council; that you employ a corps of workmen for the removal of all excrement from privies, pig pens, chicken coops and stables, and that you collect the cost of such sanitary labor from the owners of the property.

Fifth. You are further directed to print the foregoing, and place a copy of the same in every family in your borough.

Very respectfully,

R. LOWRY SIBBET, M. D.,

Medical Inspector State Board of Health.

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The council of the borough of Greencastle cordially endorse the above recommendations of the State Board of Health, and earnestly request that each citizen will at once comply with those referring to privies, hog pens, chicken coops and stables, by having the same cleaned and limed, and that those citizens living along the water course will not hereafter empty slops, offal, etc., in the said stream.

By promptly complying with the suggestions the cost of official interference will be avoided.

By the council.

SAMUEL DETRICH, *Burgess.*

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c. Small-pox at Morrisville, Bucks County.

NOTICE FROM JOHN KNOWLES, BURGESS.

MORRISVILLE, BUCKS CO. PA., *November 23, 1891.*

BENJAMIN LEE, M. D., *Secretary State Board of Health, Philadelphia, Pa.:*

DEAR SIR: We have a case of small-pox in our borough. The borough authorities have used all the efforts in their power to control the spreading of the disease: however, our authority in such matters is so limited that we are very much handicapped in doing so. In lieu of this fact we deemed it advisable to ask your advice and assistance. If there is anything you can do to aid us in controlling the same we should be very much pleased to have you do so.

Yours very truly,

JOHN KNOWLES,
Burgess.

REBLY BY THE SECRETARY.

November 24, 1891.

Mr. JOHN KNOWLES, *Burgess, Morrisville, Bucks county, Pennsylvania:*

DEAR SIR: Accept my thanks for your favor of yesterday informing me that you have a case of small-pox in your borough. I send you one hundred of our circulars on this disease, which you would do well to have distributed immediately, beginning in the neighborhood of the house in which the disease exists. You should also issue a proclamation in your local paper, if you have one, if not in a Doylestown paper, urging all persons not properly protected by vaccination to be at once vaccinated. You should name a vaccine physician and offer free vaccination to all persons of limited means. You should obtain a sufficient number of vaccine points to meet all demands. These you can obtain at a discount from Dr. H. M. Alexander, Lancaster county Vaccine Farms, Marietta, Pennsylvania. If the patient is too poor to provide

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medical attendance and nursing, the poor directors should remove him or her at once to the county small-pox hospital.

The poor directors, I understand, are Benjamin Schuyler, John Johnson and Alonza Nicholas.

If he remains in his present house, guards should be established for day and night, and no one should be allowed to enter or leave the premises except the physcian who should make an entire change of clothing and bathe with a disinfectant before mingling with other citizens or visiting other patients. I am not able to agree with you that your powers in this respect are limited; I regard them as absolute. I will, however, send the medical inspector of your district to confer with you, and advise such further precautions as he may deem necessary, and if you desire it will allow him to furnish your guard with a State Board of Health badge in order to enforce authority. Food and other necessaries of life should be passed by the guard to the inmates without contact, and other requests should be made by word of mouth, nothing being allowed to be passed outside the lines. I beg that you will keep me constantly informed of the condition of affairs, the progress of precautionary measures and the occurrence of any new cases.

Is Morristown connected by bridge with Trenton? If so it might be well to place a guard at the end of the bridge to examine all persons crossing from New Jersey, and especially Italians for evidences of the disease.

I have the honor to be,

Yours respectfully,

Secretary.

INSPECTION BY MEDICAL INSPECTOR W. B. ATKINSON.

PHILADELPHIA, *November 25, 1891.*

Inspection at Morrisville, Bucks county.

Subject of complaint—small-pox.

The single case of the disease is in the person of E. L., aged twenty-two years, a substitute telegraph operator. He was exposed to the contagion at Trenton, N. J., where this disease is reported as being very prevalent, as well as at Newark. The eruption appeared on Tuesday, November 17. It is a discrete but well marked attack. He is under the professional care of Dr. Worman of Trenton. He has never been vaccinated, not believing in this method of prevention. The burgess, Mr. John Knowles, had already put a sign "small-pox within" on the gate

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of the dwelling where the patient is living with his father and mother. He is under the care of a professional nurse, and everything has been done according to the latest sanitary views. Under the direction of Burgess Knowles, the proper guard has been posted, and quarantine has been instituted. The physicians are vaccinating all who were not protected. In company with the burgess I rode out some two miles to a house beyond the suburbs which it is proposed to put in repair, and use as a pest house in the event of other cases occurring.

Dr. William Case is the only resident physician of Morrisville, but Drs. Rice and Worman, of Trenton, attend many of the people. The population of the town is 1,200. Fallsington, distant two miles, has 500. Dr. I. N. Richards is located there. Yardleyville is distant four miles with 800 people; Tullytown is seven miles with 300. Trenton is connected with Morrisville by means of two bridges. As everything has been done and well done, there is nothing further to recommend. I have thought it would be well to suggest that the employes of the Pennsylvania railroad which runs through the place should be required to be vaccinated. From a conversation with Dr. Rice, of Trenton, I learned that he knew nothing of any effort being made by the New Jersey State Board of Health to stamp out the epidemic.

(d.) Diphtheria at Erie, Erie County.

ERIE, *January 6, 1892.*

Telegram from Dr. A. A. Woods.

BENJAMIN LEE, M. D., *Secretary:*

Telegraph power to close schools here. Diphtheria epidemic. Come if I telegraph. Explanation by mail.

A. A. WOODS,
Health Officer and Inspector.

PHILADELPHIA, *January 6, 1892.*

From Benjamin Lee, Secretary.

Dr. A. A. WOODS, *Medical Inspector, Erie:*

Close such schools as you consider necessary to check epidemic of diphtheria.

BENJAMIN LEE,
Secretary.

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FROM A. A. WOODS, MEDICAL INSPECTOR.

ERIE, PA., *January 9, 1892.*

BENJAMIN LEE, M. D., *Secretary State Board of Health, 1532 Pine Street, Philadelphia:*

DEAR SIR: The reason for my asking for delegated authority from you to close the schools in this city is this: We have had a steady prevalence of diphtheria from the middle of September to the present time, and the cases in many families have been very malignant. Placarding has been resorted to generally with other means such as fumigation, disinfection, etc. We have had seven or eight deaths per week for the last three weeks. Now the case stands exactly this way: Within the last week reports have come in that pretty well cover the different parts of the city. There are fully thirty-five cases now sick, and the deaths continue at the rate above stated. I therefore think it would be advisable to close the public schools of the city as well as the Catholic or parish schools. The trouble arises from the unwillingness of the board of education to close their schools, and there has been much personal feeling and an antagonism developed against me on this question. In the beginning of the trouble some physicians were slack about reporting, but at present I believe all cases are promptly reported.

Now, I do not know, of course, that closing the schools for a term, say three weeks, would check the spread of the disease, but I firmly believe that it would be a wise precautionary measure, and would certainly have a good effect eventually. I may have to telegraph you to come up. I shall do so if matters do not mend sooner. The board of education pretends to question the power of the State Board to close the schools, and especially my delegated authority as received from you.

I wish you would write me the construction of the law that you believe to be binding—that is how far has the Board quarantine powers; how far they have been delegated to you when the Board was not in session, and what quarantine powers I may exercise as inspector and under your instructions? In looking over the law I see that the Board has full quarantine power, and as I understand it the executive authority has been delegated to you when the Board is not in session.

What legal measures would you suggest that I should take in case it becomes necessary to enforce upon the board of education?

I will telegraph you if it seems necessary for you to come to Erie.

FROM A. A. WOODS.

ERIE, *January 12, 1892.*

DR. BENJAMIN LEE, *Secretary:*

Did you get my letter; telegraph best way to proceed, to legally compel?

A. A. WOODS.

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FROM THE SECRETARY.

Dr. A. A. WOODS, *Health Officer, Erie:*

Letter received; full powers delegated to me by express regulation.

BENJAMIN LEE,
Secretary.

FROM A. A. WOODS.

ERIE, *January 13, 1892.*

BENJAMIN LEE, M. D., *Secretary Pennsylvania Board of Health, Grand Pacific Hotel:*

Total cases reported since September, 195. Deaths—October, 10; November, 11; December, 25; January, 15. Week ending December 19, 7; deaths ending December 26, 9; January 2 and 12, 8 each. New cases reported January 10, 11, 12—eleven in all.

ERIE, *January 13, 1892.*

To BENJAMIN LEE:

New houses have 20; 8 placarded houses; 44 cases; Catholic schools closed. I proposed to committee to close building having pupils sick. They refused papers; condemn Board: majority people support me; lawyer advises peremptory mandamus; court will grant. Had I not best apply? when leave Chicago? statement at your office.

A. A. WOODS.

Closing of Schools.

May 20, 1892.

Dr. A. A. WOODS, *Health Officer of Erie, Medical Inspector to the State Board of Health for the Lake District:*

SIR: You are hereby empowered and instructed, under authority of, and in the name of the State Board of Health of the Commonwealth of Pennsylvania, to close all schools, both public and private, in the city of Erie, on receipt of these instructions, and to keep the same closed until the present epidemic of diphtheria shall have so far abated that in your judgment of the interests of the public health will warrant you in permitting them to be re-opened.

You are further empowered and instructed to enforce domiciliary quarantine of any house, or houses in which the above mentioned disease in any of its various forms (whether diphtheria, diphtheritic sore throat, diphtheritic or membranous croup) exists, or has so recently existed that they may reasonably be supposed to be still infected, in any instance in which in your judgment this step is necessary for the protection of the public.

BENJAMIN LEE,
Secretary and Executive Officer.

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AFFIDAVIT, ETC., TO A. A. WOODS, M. D., FROM THE SECRETARY.

May 20, 1892.

I hereby certify that on the sixth day of January, A. D. 1892, I received from Dr. A. A. Woods, Health Officer of Erie, and Medical Inspector to the State Board of Health for the Lake District, the following telegram:

"Telegraph power to close schools here, diphtheria epidemic, come if I telegraph to-morrow, explanation in post."

To this I at once replied:

"Dr. A. A. WOODS, *Health Officer, Erie, Pa.:*

Close such schools as you consider necessary to check epidemic of diphtheria."

BENJAMIN LEE,
Secretary State Board of Health.

On the eleventh day of January I received a letter from Dr. A. A. Woods, which contained an inquiry as to what the powers of the Secretary of the State Board of Health were, during the interval between meetings of the Board. To this I replied by telegraph as follows:

"Letter received; full powers delegated to me by express regulation."

On the twenty-eighth day of March this action on my part was reported to the Board at a special meeting held on the train between Williamsport and Erie and at the Reed House, and was formally approved by the Board. Dr. A. A. Woods was present by invitation at the meeting at the Reed House and was officially assured by the Board that his conduct of the epidemic had met its unqualified approbation and that under the authority already conferred, he had power to order the schools to be closed. He was also advised by the Board that the presence of diphtheria in ten different houses would justify such action. Subsequently to the meeting of the Board, by virtue of the authority conferred upon me by regulation of the Board, I verbally repeated and confirmed the order and judgment of the Board, at the same time recommending the destruction of such school books as had been exposed to the infection of diphtheria.

BENJAMIN LEE,
Secretary and Executive Officer, State Board of Health of the Commonwealth of Pennsylvania.

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(e.) Diphtheria at Locust Gap, Northumberland County.

Complaint by Dr. B. F. BARTHO.

MT. CARMEL, PA., *February 6, 1892.*

BENJAMIN LEE, M. D., *Secretary of the State Board of Health:*

A sad state of affairs has been existing in Locust Gap, a town of about 1,800 inhabitants, located about two miles from Mt. Carmel. Between thirty and forty children have died of diphtheria within the last two weeks, and the disease is still prevalent, three deaths occurred last night, and I know of six grave cases still existing.

With a very few exceptions these cases have been, and are now, treated as non-contagious. Visitors are coming and going all the time, all go in the sick room; all the children in the house are kept in the same room, etc. In case of a death they have "wakes." Mothers with a house full of children go to these "wakes," sit a whole night with the corpse, and in some instances one or two others come in the house, or room, go home in the morning to their own children. Funerals are public, etc. The consequences are that we have quite a number of cases reported in Mt. Carmel the last week or two.

The attending physicians have done all in their power to stop the above referred to evil, but it is of no use—they will not listen. While talking very earnestly this morning to a number of women who had gathered around a dying child on the subject, one of their number took issue, and started to argue thus:

"Here is Mrs. ——, with five children at home. She has washed and "laid-out" every child that died of diphtheria this winter, attended all the wakes, and none of her children have had the sore throat."

Another took up the argument before I had a chance to reply to the first, and said, "I'll tell you doctor how this is, if it is God's will that a child shall have the sore throat, no care will prevent it, and unless it is God's will nothing can make them get it," etc.

What can be done? Is there no way to stop it? I have talked to their priest, and he is working faithfully and in harmony with the physicians. Can you suggest a plan or method to work on?

Yours respectfully,

B. F. BARTHO.

FROM D. W. LEISER.

LEWISBURG, PA., *February 12, 1892.*

BENJAMIN LEE, M. D., *Secretary State Board of Health:*

DEAR SIR: Locust Gap is a mining town of about two thousand inhabitants. They have no physician at the place but receive their

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medical treatment from physicians living at Mt. Carmel. I wrote to Dr. B. F. Bartho, of Mt. Carmel, and inclose you his answer. I also wrote to Rev. Father Fleming, but as yet have received no answer. I have no doubt that either of them would see that the circulars on diphtheria would be properly distributed. Please send them.

Respectfully,

WM. LEISER, *Medical Inspector.*

FROM D. A. MCCARTHY.

LOCUST GAP, PA., *January 19, 1892.*

State Board of Health, Philadelphia, Pa.:

GENTLEMEN: Diphtheria is still raging here; what should be done? Awaiting an early reply, I am, very respectfully yours,

M. A. MCCARTHY, *P. M.*

P. S.—If you will send 400 or 500 of those circulars I will have one delivered to each house in the place.

FROM DR. B. F. BARTHO.

MT. CARMEL, PA., *February 22, 1891.*

BENJAMIN LEE:

DEAR DOCTOR: The circulars you kindly sent me have been properly distributed.

Ex-commissioner (county) Kellegher resides in Locust Gap. I am attending to one of his children now that is suffering from diphtheria. I have four cases under my care at present, and if reports are true six or eight more cases exist.

Last night two children died from the disease.

I have decided to accept the position of deputy medical inspector, and have begun work to-day by seeing a number of the prominent citizens. They all seemed very anxious to do something to prevent the further spread of the disease. I also called on Father Burk, pastor of the Catholic church. This is the only church in the place, and he will help all he can. In a few days we will have everything in working order. If you have any instructions for me or the prospective local board, please send them at once. We will experience the most trouble in isolating all the cases. The "wakes" and public funerals we can manage better. Mt. Carmel borough and Mt. Carmel township will cover the area.

Yours respectfully,

B. F. BARTHO.

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FROM B. F. BARTHO, M. D.

MT. CARMEL, PA., *February 15, 1892.*

WILLIAM LEISER, JR.:

DEAR SIR: I was at Locust Gap yesterday, and found the people talking in an excited way over the spread of diphtheria. A number expressed themselves as willing to be members of a local board, etc. I having only one case myself at present, I got ex-Commissioner Kellegher to make an inquiry as to the number of cases existing. This morning he reported to me six cases, and one lying dead.

Yours truly,

B. F. BARTHO.

FROM DR. B. F. BARTHO.

MT. CARMEL, PA., *March 7, 1892.*

BENJAMIN LEE, M. D.:

DEAR DOCTOR: I have spent about three days in Locust Gap, Pa., in organizing a local board, and will enclose a clipping from their local paper containing proceedings of first meeting.

The sanitary condition of the place is very bad. Most of the houses are old and dilapidated; the yards are full of filth of all kinds. Most privies are running over, and every heavy rainfall caused some of the debris to be washed to a lower level, which in many cases is in front of the back kitchen door.

The water supply is derived, with a few exceptions, from wells and springs. All except two are located in places where they receive surface drainage from districts such as I have described above.

The local board has done a great deal of good already, and will accomplish still more. Diphtheria is present only in two houses now; these houses are quarantined. No "wakes" or public funerals have been held since the local board organized. As soon as the snow leaves the ground chloride of lime will be freely used in privies and yards, etc., and the place cleaned up in general, houses included. Father Burke deserves a great deal of credit, for without his assistance the present work of the local board would be very difficult, nor could the organization have been efficient in such a short time at least.

Yours respectfully,

B. F. BARTHO.

FROM DR. B. F. BARTHO.

MT. CARMEL, PA., *March 10, 1892.*

BENJAMIN LEE:

DEAR DOCTOR: The Rev. Father William J. Burke's address is Locust Gap, Northumberland county, Pa.

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We are still getting along very nicely, only one new case reported this week.

The Philadelphia and Reading Coal and Iron Company own almost all the property. We wrote to Mr. M., their land agent, informing him that quite a number of cellars contained water. Mr. M. called on me yesterday and showed me a letter from a superior officer instructing him to have all such cellars as contain water drained as soon as possible.

Yours respectfully,

B. F. BARTHO.

(f.) Scarlet Fever at Eldred.

NOTIFICATION FROM L. L. OWENS.

ELDRED, PA., *January 19, 1892.*

DR. BENJAMIN LEE, *Secretary State Board of Health, Philadelphia, Pa.:*

DEAR SIR: Last week there developed in our school several cases of scarlet fever, and we immediately closed the school to await developments.

We took council from our doctors; we find that they are divided in opinion in regard to the manner in which the disease becomes contagious or is imparted to others. Their opinion is at variance in regard to the period that the disease is contagious. Some maintain that it is not contagious until the period that peeling commences, and others from the inception or development of the fever.

Now we look to you as an authority, and will be guided by your decisions. So far there has been only four cases that have developed in the school, and as we have over three hundred pupils in the one building we wish to use every precaution to keep it from becoming epidemic.

Please give me an early reply.

Yours respectfully,

L. L. OWENS,

President Board School Control.

REPLY BY THE SECRETARY.

January 23, 1892.

Mr. L. L. OWENS, *President Board of School Controllers, Eldred, Pa.:*

DEAR SIR: I send to your address 300 circulars, School Hygiene, containing the information you desire on pages 11 and 12. Also 300 circulars on scarlet fever. Would be well to distribute freely among families from which pupils attend the schools under your control. Scarlet fever is contagious from the commencement of the case, but more so during the stage of desquamation or peeling than earlier. The shed skin is very infective. Hence the importance of forbidding the

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return of children apparently well, but still shedding the cuticle. That is also the time when fatal relapses are most apt to occur, so that it is in the interest of the patient's health that it should be kept in doors. I also send placards for infected houses. If Eldred is not a borough, it would be well to call a town meeting and insist on the use of these in all cases. Let me know if I can be of any further service.

Yours respectfully,

BENJAMIN LEE,
Secretary.

(g.) Small-pox at Tower City, Schuylkill County.

Instructions to Dr. W. MURRAY WEIDMAN.

March 25, 1892.

Dr. W. MURRAY WEIDMAN, *Medical Inspector, Reading, Pa.:*

DEAR DOCTOR—I enclose instructions for an investigation into a reported case of small-pox at Clark's Valley, twelve miles north of Pine Grove, in the person of the son of John C., aged eighteen years.

If you verify the diagnosis call a town meeting, appoint quarantine and finance committees, placard the house, establishing guards if necessary, and make provisions for food and medical attendance, and in case the parties are poor notify the county commissioners that they will be expected to bear the necessary expenses. Your action in regard to details will, of course, be somewhat modified and by what you find in regard to the population of the place and situation of the house.

Yours very truly,

BENJAMIN LEE,
Secretary.

REPORT OF INSPECTION BY DR. WEIDMAN.

READING, *March 28, 1892.*

I visited Tower City, near Clark's Valley, and ascertained that J. C. S., aged 19, came to Tower City (Wednesday week) sick, from Lehighton, Carbon county, where he lived in the family of F. B., remained at U.'s hotel in Tower City over night. Went to his step-father's (C.) next day, when Dr. E. F. Williams saw him sick with small-pox, in confluent form. He died on Saturday last, about 4 o'clock, and was buried Sunday 3 a.m.

The house is situated down the valley about one mile and a half south. The family, except the father who acted nurse, moved to the barn about 60 yards distant from the house, where they have lived during this time. House was flagged and guarded; a nurse was obtained from Philadelphia. Four meetings were called (to-morrow evening another will be held) and a finance committee of five appointed, who are

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making every effort to collect money. The nurses (step-father and professional), are in quarantine, and will be kept isolated until Friday next. The house has been fumigated, scrubbed and paper removed from walls in the room where S. lay and died. Similar precautions had been carried out at the hotel.

Mrs. S. positively refused to have the family vaccinated, although Dr. Williams made persistent requests. I gave him a written order to make another effort; in case of refusal to report to the justice of the peace, the highest official in the city, who promised in that event to send the constable with the doctor and threaten to remove the entire family to the almshouse if still obstinate. The town committee's threat of prosecution being of no avail.

As soon as he died the body was wrapped in a sheet, saturated with bi-chloride solution, sewed in a rubber blanket similarly treated, placed in a hermetically sealed box and deposited in a grave seven feet deep, over which was placed 75 lbs. of chloride of lime, then covered with the ground, interval between death and burial already indicated.

Rumor says several persons in F. B.'s family in Lehighton have been and are now sick. Certain it is, he came to Tower City with small-pox. Think it prudent to inquire into condition of things at Lehighton as I wrote you by postal and telegraphed you at Erie.

I left with Dr. Williams and the landlord several copies of instructions—printed circulars—and gave Dr. Williams the copy of your directions to me concerning calling town meetings and notifying the county commissioners that they would be called upon to pay expenses, which I think they should do, as the town committee of Tower City have acted promptly under advice of Dr. Williams and thus saved them much expense, etc.

Dr. Williams stated that the slaughter houses are about in the same condition in which you found them at your visit several years ago, and that typhoid fever has appeared spring and fall ever since.

LETTER TO DR. E. F. PHILLIPS, BY THE SECRETARY.

April 5, 1892.

DR. E. F. PHILLIPS, *Tower City, Pa.:*

DEAR DOCTOR: I find on my returning from the Sanitary Convention at Erie, your postal card announcing the fact that two more cases of small-pox, with possibility of a third have occurred in the C. family, and that the head of the family will not permit the remainder to be vaccinated. Do I understand that you are the physician in attendance on this family? If so, tell him that the regulation of the board requires vaccination of all persons exposed to the disease, and that the penalty for refusing to comply is $100.00 in each case. Quarantine of this house should be strictly enforced, and the expenses of maintaining a guard

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should be met either by the county commissioners, or by subscription among the citizens of that township. Please report daily to Dr. Weidman, who will keep me informed of the progress of the epidemic.

Yours very truly,

BENJAMIN LEE,
Secretary.

LETTER TO THE CHIEF BURGESS OF TOWER CITY.

April 5, 1892.

To the Chief Burgess, Tower City, Pa.:

DEAR SIR: Kindly inform me by return mail what the present number of cases of small pox and varioloid is in your borough. You, of course, understand that you have ample authority, and that it is your duty to place guards over every house in which a case of either of these diseases exists. No one except the physician should be allowed to go in or out, and one physician should be named to attend to all these cases, in order to avoid the risk of carrying the contagion from house to house. I send you placards, which should be placed by your authority, on the front of every such house, and not removed under a penalty of one hundred dollars until a physician has given a certificate that both the inmates and the house have been properly disinfected. Let me know if you need more placards. One of them should be placed on the C. house in Clarke's Valley. I will ask you to have a careful investigation made to determine how the first case originated. I send you fifty of our circulars on the proper precautions to be taken, which I will request you to have distributed in the neighborhood of infected houses, as well as in them, and will send more of both placards and circulars if you need them.

Yours respectfully,

BENJAMIN LEE,
Secretary.

(h). **Small-pox at Titusville, Crawford County.**

A family of immigrants, a woman and two children, arrived at Titusville, March 9, from Odessa, via New York. Shortly a child aged three and a half sickened with small-pox. The Board of Health at once being notified, quarantined the house and urged all the citizens to be vaccinated, and in every way took precautions to prevent the spread of the disease.

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FROM HEALTH OFFICER JENKINS.

NEW YORK, *May 22.*

Dr. B. LEE, *Secretary:*

Steamship Diana, from Hamburg, arrived here 5th instant, with one case of small-pox on board. Case was isolated, transferred to the hospital. Ship disinfected and passengers in steerage which he occupied held for observation until 20th instant without development. All passengers on board were vaccinated by the ships surgeon before the development of the eruption with largest percentage of effects ever seen here.

W. T. JENKINS,
Health Officer.

LETTER FROM T. L. HOBART, SECRETARY OF THE BOARD OF HEALTH.

TITUSVILLE, PA., *April 12, 1892.*

Dr. BENJAMIN LEE, *Philadelphia, Pa.:*

DEAR SIR: The patient in the case of small-pox reported to you some time ago, has fully recovered and the quarantine on the premises has been removed. The patient was a girl three and a half years old, two and a half years since successfully vaccination. The disease was in a modified form or well developed varioloid. All persons who had visited the infected house were promptly vaccinated, as were also the family of the patient. After all danger from infection was over the premises were thoroughly disinfected and fumigated as per the recommendations of the State Board of Health.

Yours respectfully,
THOS. L. HOBART,
Secretary.

(i.) Diphtheria at Seven Valley.

NOTIFICATION FROM J. W. KOHR.

SEVEN VALLEY, PA., *June 17, 1892.*

B. LEE, M. D.:

DEAR SIR: This community has had and has yet a great deal of diphtheria, and it seems there is nothing like stopping its onward progress. Will you be kind enough to inform me what the latest and best preventative for it is. I am ignorant as to what to advise.

Hoping you will favor me with an early reply and greatly oblige,

Yours respectfully,
J. W. KOHR.

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NOTICE FROM CITIZENS.

SEVEN VALLEY PA., *June 22, 1892.*

To the Board of Health of Pennsylvania:

Will you give the following your kind consideration:

This village is situated ten miles south of York, in the county of York, and is not incorporated. Population, about three hundred. It lies along the Northern Central railroad, Smyser's station, Springfield township.

We have had for the last eight months an epidemic of diphtheria which has not abated yet; also had several cases of typhoid fever, of which two proved fatal and one case of the latter has developed again of late, but the patient has been removed to the adjoining township, N. Codorus.

To guard against diphtheria some of the citizens have taken all sorts of precautionary measures, but as there is no way of making them general not much good results, as some are too careless, some too ignorant and others positively refuse to do anything, and consequently new cases are constantly developing.

Now we petition you to do for us what you can. We think the water supply ought to be analyzed, and stringent sanitary measures adopted.

Some of those that have had fatal cases in their families insisted in having regular country funerals, and no argument will avail.

We are not well enough posted as to what you can do and what you can decree, but nothing short of force will have any effect.

By giving your kind and prompt attention, you will oblige,

Yours truly,

W. F. WEIHMILLER,
J. W. KOHR,
N. GLATFELTER,
H. C. KUNTL,
D. M. HENRY.

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k. Small-pox at Pittsburg, Allegheny County.

April 16, 1892.

BENJAMIN LEE, M. D.:

DEAR SIR: I wish to inform you of a case of small-pox in the city of Pittsburg. A Polander, by name John C., arrived in the city last Saturday from up the Allegheny river some where, we could not ascertain. We sent him to the Municipal Hospital and disinfected the premises, and vaccinated people who had came in contact with said patient.

Respectfully yours,

W. F. MCKELVY.

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June 13, 1892.

BENJAMIN LEE, M. D., *Secretary State Board:*

DEAR SIR: I have several cases of small-pox to report this morning. On the 9th instant two cases reported—Paul M., 50 years of age, vaccinated at the age of 6 years in Germany, four marks, smooth patches, and Joseph N., 32 years of age, vaccinated during childhood, small mark not well defined. On the 10th instant another case—Joseph M., 24 years of age, vaccinated 10 years ago, good sized cicatrix. All of these in same ward and close together. And another case on the 11th inst.—Cora A. H., 20 years of age, teacher in Duquesne College, situated on the top floors of our office (Bureau of Health). She has two apparently good and large marks; can't remember when vaccinated. This case could have no connection with others; is in another ward quite a distance away. I have delayed giving you this information in the hope of being able to trace the source of disease, but as yet have been unable to do so. Every precaution has been taken, even to placing a policeman at each house. These cases coming all at once have somewhat alarmed us, but we think we can manage it.

Respectfully yours,

W. F. MCKELVY,
Chief Clerk.

June 18, 1892.

BENJAMIN LEE, M. D.:

DEAR SIR: I desire to inform you of another case of small-pox in our city—Robert J., of Thirty-ninth street. This man arrived in our city from New York this day one week ago, June 11, direct from Ireland; case taken at once to our hospital; vaccination and house fumigated at once; no further spread as yet from our other cases.

Respectfully yours,

W. F. MCKELVY,
Chief Clerk.

PITTSBURG, *July 23, 1892.*

BENJAMIN LEE, M. D.:

DEAR SIR: I wish to report to you one case of small-pox at No. 1144 Pennsylvania avenue, Pittsburg—an Italian named Vinceuro M., 35 years of age, single. He says he came here one month ago from Parkersburg, Virginia, but we are satisfied that he came here but a few days ago. Another Italian named P. A., from the same house, and reported sick as this man, left Pittsburg Saturday, July 23, for Dunbar, Pa., to work in stone quarry owned by Sloan & Co. I have notified J. R. Thompson, M. D., your inspector for this district.

Respectfully yours,

W. F. MCKELVY,
Chief Clerk Board of Health.

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PITTSBURG, *September 29, 1892.*

BENJAMIN LEE, M. D.:

DEAR SIR: In reporting these cases of small-pox to you I wish to say that the cause of delay arose from the fact that I wished, if possible, to ascertain the source of these cases, but have been unable so far.

I report Thomas J., 26 years old, Craig street, Thirteenth ward, had been vaccinated; two marks, small and imperfect; also his child, Lizzie J., six weeks old, of same place; not vaccinated; removed the father, child and mother to our hospital, and thoroughly disinfected the house and vaccinated the people in the neighborhood. The other case is Myron K., 35 years of age, 29 Federal street, Seventh ward; had been vaccinated; two small but good cicatrices. The first two cases reported on September 24 and the last on the 27th of September. In the future I shall not await developments but will notify you at once. Trusting this is satisfactory, I am,

Respectfully yours,

W. F. MCKELVY,
Chief Clerk.

P. S.—I should state that the last case mentioned, namely, Myron K., was also removed to the hospital and the house disinfected and quite a number vaccinated. Would also state that none of these cases are considered serious.

PITTSBURG, *September 30, 1892.*

BENJAMIN LEE, M. D.:

DEAR SIR: I hereby report to your office a case of small-pox (hemorrhagic) reported to this office this morning—one W. H. M., 30 years, Olive street, Thirteenth ward. Patient had never been vaccinated. Removed to Municipal Hospital and house disinfected, and people in immediate neighborhood vaccinated.

Respectfully yours,

W. F. MCKELVY,
Chief Clerk.

(1.) **Typhus Fever at Hazleton, Luzerne County.**

NOTICE FROM DR. H. W. COLE.

HAZLETON, *May 31.*

Dr. B. LEE, *Secretary:*

I lost case of typhus fever; emigrant, lately arrived. Had him buried at once. Ship's name unknown. House thoroughly disinfected. All clothing burned. Any suggestions?

H. W. COLE.

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FROM DR. T. W. JENKINS, HEALTH OFFICER, NEW YORK.

DR. B. LEE, *Secretary:*

There has not been a case from any ship since the Massilia. Had the decedent no baggage indicating whence and when he came? May have come via any other port, Philadelphia or Baltimore. Send further particulars. Verify diagnosis or autopsy.

WM. T. JENKINS.

(m.) Small-pox at Mill Creek, Huntingdon County.

WILKES-BARRE, PA., *June 29, 1892.*

MY DEAR DR. LEE: On my return a case of small-pox was reported at the village of Mill Creek, three miles from here. I visited the patient to-night with Dr. Long to confirm diagnosis, and in consultation with the poor directors we arranged for the building of a pesthouse to-morrow morning, and removal of the patient to it. He is a Hungarian, in this country only two weeks. Name M. S., aged twenty-three; single. It is impossible as yet to find what vessel he came in, but I believe he shipped from Antwerp. He is in a boarding house with about thirty people in the frame block of three houses in which he resides. These will all be vaccinated at once. I did not wait to communicate with you before acting, as I knew no time should be lost. Sent telegram this evening, and will keep you informed as other cases develop.

Yours truly,

LEWIS H. TAYLOR.

(n.) Small-pox at Coudersport, Potter County.

Under date of June 14, Chief Burgess C. P. Armstrong, of Coudersport, telegraphed the Secretary: "There is small-pox at Tannery Village adjoining this borough. Will your Board take action?"

The Secretary replied: "Have sent Inspector. Dr. Alexander, of Marietta will furnish vaccine points at a reduction. Notify Olmstead."

At the same time he telegraphed Dr. E. D. Payne, Medical Inspector at Towanda, "small-pox near Coudersport. Inspect, quarantine, vaccinate. Notify county commissioners that they must bear expenses. Dr. Alexander, of Marietta, will furnish vaccine points at a reduction."

A communication was also received from the Hon. Wm. Jones, president judge and member of the House of Representatives, requesting the interference of the Board. Owing, however, to the illness of Dr. Payne, and the illness or pressing professional engagements of other inspectors, several days elapsed before the Secretary succeeded in obtaining

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the services of Dr. J. R. Thompson, Medical Inspector of the Allegheny district, residing at Pittsburg, whose report is appended.

On the second day the Secretary received the following communication:

Dr. B. LEE, *Secretary:*

Small-pox having broken out within a few miles of our town (Hammonds), I being appointed a committee write for instructions. We have a large number that have never been vaccinated, and some of them refuse. What can we do? Does the State furnish virus for free vaccination? If a man comes to our town from an infected district what can we do? Our town is not incorporated; we have say 800 inhabitants. Please give me full instructions and send me a small supply of virus.

C. G. FISHER, M. D.

REPLY OF THE SECRETARY.

Dr. FISHER: State Board of Health orders vaccination. Penalty for refusal may be one hundred dollars. County commissioners should pay for virus. I have advised Dr. Alexander to send fifty points.

BENJAMIN LEE,
Secretary.

INSPECTION AT COUDERSPORT, POTTER COUNTY.

By J. R. THOMPSON, *Medical Inspector*, on account of small-pox.

PITTSBURG, *July 2, 1892.*

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Coudersport on June 23, 1892, and found the following conditions to exist:

On receipt of your telegram of June 21, 1892, I started the following morning, via Allegheny Valley railroad to Coudersport, Potter county, to investigate rumor of small-pox, and arrived at that point June 23, 1892. A committee of ten (10) citizens of the borough had already been appointed to take such action as might be necessary under the circumstances. I found not a few of the citizens in doubt as to whether the disease was small-pox, on account of an article which appeared in the town paper the "Potter Enterprise" over the signature of Dr. E. H. A., one of the town physicians, which article I will enclose with this letter. The two older physicians of the town Dr. Ellison and Dr. Buck had pro-

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nounced the cases small-pox before my arrival, although neither of them had ever seen a case before. I immediately visited the infected district, which is just outside the borough limits. Found two young girls far advanced in the disease and recovering, crusts having fallen off, leaving nothing but the pits from discrete small-pox, more distinctly noticeable under the clothing, and which Dr. Ashcraft probably did not take time to examine, but just observed the children's faces at a distance which are less pitted and show less pigmentary deposit. Four (4) cases more developed from the first original case (the child P.) which makes seven (7) in all which have been attacked by the disease, and I took every precaution to limit it to that number. Five of the children in the pesthouse are the children of S. S., and the other child is the child of a man by the name of W. The parents of these children have been well vaccinated in the old country, each having four (4) marks. The patients are under the care of Dr. Buck and a nurse. The committee promised to stand good for such things I might deem proper to burn before fumigating the houses, and a few things were burned that could not be boiled or fumigated such as bedding, bolsters and pillows. Fumigated with sulphur. The child P. that was first attacked and which died must have contracted the disease in this country, they are all Polanders, and it is hard to be understood, or make them understand. The people coaxed me to remain longer than I intended, consequently this delayed letter.

QUARANTINE NOTICE.

And now, June 25, 1892, it appearing that the small-pox has broken out at Hoyt's Tannery, near the borough of Coudersport; *And whereas*, it appearing that there is great danger that said disease will be communicated to the people of Coudersport and vicinity by the passing of people from the infected district to said borough. It is now ordered by the State Board of Health of the Commonwealth of Pennsylvania that the streets, lanes and passages from said tannery and vicinity to the borough of Coudersport be strictly quarantined by the stationing of a sufficient number of special policemen across said streets to prevent the passage of persons from said tannery and vicinity to the borough of Coudersport, and all persons violating said quarantine are notified that they will be prosecuted as provided by act of June 3, 1885.

J. R. THOMPSON, M. D.,
Medical Inspector State Board of Health.

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TO DR. FISHER FROM BENJAMIN LEE, M. D., SECRETARY, PHILADELPHIA.

PHILADELPHIA, *July 6, 1892.*

C. G. FISHER, M. D., *Roulette, Pa.:*

DEAR DOCTOR: Will you please inform me at once if the cases of small-pox you reported on the 25th ulto. are the same as we have on hand at a tannery near Coudersport?

Your immediate attention will oblige,

Yours very truly,

BENJAMIN LEE,
Secretary.

REPLY OF DR. FISHER.

ROULETTE, PA., *July 10, 1892.*

BENJAMIN LEE, M. D., *Philadelphia, Pa.:*

DEAR DOCTOR: In reply to your (enclosed) inquiry of July 6, they are the same.

How are you to better the following practice. I know of two cases where exposure was supposed to have taken place at the tannery, and the persons went to another town. Now in place of taking care of them that they would not expose any one else, the citizens would order them to leave town. One case came to Roulette, was ordered out of town, went to Coudersport and was ordered from there. Should such a thing be allowed? Whose place is it to look after these things. We have no board of health in country towns. What constitutes a board is not protective. Can anything be done for better protection.

I remain yours fraternally,

C. G. FISHER.

(o.) Diphtheria at Kirkwood, Lancaster County.

STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH OF PENNSYLVANIA.

Order:

Whereas, an epidemic of diphtheria is prevailing in Kirkwood and vicinity, which has resulted in the deaths of five persons, and, whereas, it has come to the knowledge of this board that great carelessness exists in families in which this infection is present, therefore, it is ordered:

First. That no person who has had this disease even in the mildest form shall enter any church, Sunday school, place of public, amusement or other gathering, or any house in which there are children, within six weeks of the time of being taken sick.

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Second. That no person shall enter a house in which this disease exists, except for the purpose of rendering necessary aid and assistance.

Third. That no person in constant attendance upon a person sick with this disease shall leave the house without thorough disinfection both of clothing and person.

Fourth. That all apartments, bedding and clothing which have been exposed to this infection shall be thoroughly disinfected in accordance with the instructions contained in circular No. 19, entitled Precautions Against Diphtheria.

Any person violating an order of the State Board of Health becomes liable to a penalty of one hundred dollars.

By order of the State Board of Health of Pennsylvania.

BENJAMIN LEE,
Secretary and Executive Officer.

August 2, 1892.

(p.) Smallpox at Allentown, Lehigh County.

Report by J. D. CHRISTMAN, M. D., *Health Officer.*

ALLENTOWN, *October 29, 1892.*

Dr. B. LEE, *Secretary, etc.:*

An Italian boot black residing here went to New York during the Columbian Fete, and upon his return after a lapse of some time became sick. On the 27th instant the physician in attendance reported the case as small-pox. I had him removed at once to the county pesthouse and the bedding destroyed, the house thoroughly fumigated and quarantined. I have placed guards in front and rear of the Italian quarters. Vaccinated all the inmates, 14 in number. How long shall the quarantine be maintained? No doubt but that the disease was from New York. He associated with the Italians there. Had been living here for some time previous to his visit there. Shall report later relative to his vaccination.

In haste,

J. D. CHRISTMAN, M. D.,
Health Officer.

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3. SPECIAL SOURCES OF DISEASE.

(a.) Letter to Hon. Alex. J. Weddesburn by the Secretary.

November 24, 1891.

Mr. ALEXANDER J. WEDDESBURN, *U. S. Department Agriculture, Washington, D. C.:*

DEAR SIR: Your favor of the 20th inst., in which you do me the honor to ask my opinion for your report as to the necessity and benefits of a national anti-adulteration law covering the inter-state trade is received. That we need stringent laws to prevent misbranding and injurious adulteration any one who has taken the trouble to give any study to the subject cannot fail to see. That it is unfortunate to have laws of different degrees of stringency and different scope of application in the several States is equally apparent.

If Congress could frame a law which would establish uniformity in regulation throughout the entire country the gain would be great. I am not enough of a lawyer to know exactly what constitutional objections might be raised against such an enactment, but it would seem to me that the result could be reached on the same line of procedure by which the inter-state act was obtained.

Yours very truly,

BENJAMIN LEE,
Secretary.

ACT TO PREVENT FOOD ADULTERATION.

In the Senate of the United States, as passed by the Senate March 14, 1892. Ordered to be printed for the Committee on Agriculture.

AN ACT for preventing the adulteration and misbranding of food and drugs, and for other purposes.

That for the purpose of protecting the commerce in food products and drugs between the several States, the District of Columbia, and the Territories of the United States and foreign countries, the Secretary of Agriculture shall organize in the Department of Agriculture a section to be known as the food section of the chemical division, and make

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necessary rules governing the same, to carry out the provisions of this act under direction of the chief chemist, whose duty it shall be to procure from time to time, under rules and regulations to be prescribed by the Secretary of Agriculture, and analyze or cause to be analyzed or examined samples of food and drugs offered for sale in any State or Territory other than where manufactured, or in a foreign country: *Provided*, That the same be in original or unbroken packages. The Secretary of Agriculture is hereby authorized to employ such chemists, inspectors, clerks, laborers and other employes as may be necessary to carry out the provisions of this act.

SECTION 2. That the introduction into any State or Territory, or the District of Columbia from any other State or Territory, or the District of Columbia or foreign country of any article of food or drugs which is adulterated or misbranded within the meaning of this act, is hereby prohibited; and any person who shall knowingly ship or deliver for shipment from any State or Territory, or the District of Columbia or foreign country to any other State or Territory, or the District of Columbia or to a foreign country, or who shall knowingly receive in any State or Territory, or the District of Columbia from any other State or Territory, or the District of Columbia or foreign country, or who, having so received, shall knowingly deliver, for pay or otherwise, or offer to deliver to any other person in original, unbroken packages, any such article so adulterated or misbranded within the meaning of this act, shall be guilty of a misdemeanor, and for such offense be fined not exceeding two hundred dollars for the first offense, and for each subsequent offense not exceeding three hundred dollars, or be imprisoned not exceeding one year, or both in the discretion of the court.

SECTION 3. That the chief chemist shall make or cause to be made, under rules and regulations to be prescribed by the Secretary of Agriculture, examinations of specimens of food and drugs offered for sale in original or unbroken packages in any State or Territory other than where manufactured, or in a foreign country, which may be collected from time to time under rules and regulations to be prescribed by the Secretary of Agriculture, and under his direction in various parts of the country, and publish in bulletins the results of such analyses. But the names of manufacturers or venders of such foods or drugs analyzed shall in no case be published in such bulletins until after conviction in the courts of violation of this act. If it shall appear from such examination that any of the provisions of this act have been violated the Secretary of Agriculture shall at once cause a report of the fact to be made to the proper United States district attorney, with a copy of the results of the analysis duly authenticated by the analyst under oath.

SECTION 4. That it shall be the duty of every district attorney to whom the food section shall report any violation of this act to cause proceedings to be commenced and prosecuted without delay for the fines and penal-

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ties in such case provided unless, upon inquiry and examination, he shall decide that such proceedings cannot probably be sustained, in which case he shall report the facts to the food section.

SECTION 5. That the term "drug," as used in this act, shall include all medicines for internal or external use. The term "food," as used herein, shall include all articles used for food or drink by man, whether simple, mixed or compound. The term "misbranded," as used herein, shall include all drugs or articles of food, or which enter into the composition of food, the package or label of which shall bear any statement purporting to name any ingredients or substances as not being contained in such article, which statement shall be false in any particular, or any statement purporting to name the substances of which such article is made, which statement shall not fully give the names of all the substances contained in such article in any measurable quantities.

SECTION 6. That for the purposes of this act an article shall be deemed to be adulterated—

In case of drugs:

First. If when sold under or by a name recognized in the United States Pharmacopœia it differs from the standard of strength, quality or purity according to the test laid down therein.

Second. If when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality or purity, according to the tests laid down in said work.

Third. If its strength or purity fall below the professed standard under which it is sold.

Fourth. If it be an imitation of and sold under the specific name of another article.

In the case of food or drink:

First. If any substance or substances has or have been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength so that such product, when offered for sale, shall be calculated and shall tend to deceive the purchaser.

Second. If any inferior substance or substances has or have been substituted wholly or in part for the article so that the product, when sold, shall tend to deceive the purchaser.

Third. If any valuable constituent of the article has been wholly or in part abstracted so that the product, when sold, shall tend to deceive the purchaser.

Fourth. If it be an imitation of and sold under the specific name of another article.

Fifth. If it be mixed, colored, powdered or stained in a manner whereby danger is concealed so that such product, when sold, shall tend to deceive the purchaser.

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Sixth. If it contain any added poisonous ingredient, or any ingredient which may render such article injurious to the health of the person consuming it.

Seventh. If it consists of the whole or any part of a diseased, filthy, decomposed or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or of an animal that has died otherwise than by slaughter: *Provided*, That an article of food or drug which does not contain any added poisonous ingredient shall not be deemed to be adulterated in the following cases:

First. In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names, and not included in definition fourth of this section.

Second. In the case of articles labeled, branded or tagged so as to plainly indicate that they are mixtures, compounds, combinations or blends.

Third. When any matter or ingredient has been added to the food or drug because the same is required for the production or preparation thereof as an article of commerce in a state fit for carriage or consumption, and not fraudulently to increase the bulk, weight or measure of the food or drug, or conceal the inferior quality thereof: *Provided*, That the same shall be labeled, branded or tagged as prescribed by the Secretary of Agriculture, so as to show them to be compounds and the exact character thereof: *And provided further*, That nothing in this act shall be construed as requiring or compelling proprietors or manufacturers of proprietary medicines to disclose their trade formulas.

Fourth. Where the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation.

SECTION 7. That every person who manufactures for shipment and delivers for transportation from any State or Territory to any other State or Territory any drug or article of food, and every person who exposes for sale or delivers to a purchaser any drug or article of food received from a State or Territory other than the State or Territory in which he exposes for sale or delivers such drug or article of food, and which article is in the original, unbroken package in which the same was received, shall furnish, within business hours and upon tender and full payment of the selling price, a sample of such drugs or articles of food to any person duly authorized by the Secretary of Agriculture to receive the same, and who shall apply to such manufacturer or vender, or person delivering to a purchaser such drug or article of food for such sample for such use in sufficient quantity for the analysis of any such article or articles in his possession. And in the presence of such dealer and an agent of the food section, if so desired by either party, said sample shall be divided into three parts, and each part shall be sealed by the seal of the food section. One part shall be left with the dealer, one deliv-

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ered to the food section and one deposited with the United States district attorney for the district in which the sample is taken. Said manufacturer or dealer may have the sample left with him analyzed at his own expense, and if the results of said analysis differ from those of the food section the sample in the hands of the district attorney shall be analyzed by the third chemist, who shall be appointed by the president of the Association of Official Agricultural Chemists of the United States in the presence of the chemist of the food section and the chemist representing the dealer, and the whole evidence shall be laid before the court.

SECTION 8. That whoever refuses to comply, upon demand, with the requirements of section seven of this act shall be guilty of a misdemeanor, and upon conviction shall be fined not exceeding one hundred nor less than ten dollars, or imprisoned not exceeding one hundred nor less than thirty days, or both. And any person found guilty of manufacturing, or knowingly offering for sale, or selling an adulterated, impure or misbranded article of food or drug in violation of the provisions of this act, which is a subject of inter-state commerce, shall be adjudged to pay, in addition to the penalties heretofore provided for, all the necessary costs and expenses incurred in inspecting and analyzing such adulterated articles which said person may have been found guilty of manufacturing, selling or offering for sale.

SECTION 9. That this act shall not be construed to interfere with commerce wholly internal in any State, nor with the exercise of their police powers by the several States.

SECTION 10. That any article of food or drug that is adulterated within the meaning of this act and is transported, or is being transported from one State to another for sale, and is still in the original or unbroken packages, shall be liable to be proceeded against in any district court of the United States within the district where the same is found and seized for confiscation by a process of libel for condemnation, and if such article is condemned as being adulterated the same shall be sold, and the proceeds thereof, less the legal costs and charges, shall be paid into the treasury of the United States. The proceedings in such libel cases shall conform, as near as may be, to proceedings in admiralty, except that either party may demand trial by jury of any issue of fact joined in such case, and all such proceedings shall be at the suit of and in the name of the United States.

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(b.) Pollution of Water Supply of Harrisburg.

LETTER FROM MAYOR J. A. FRITCHEY.

CITY OF HARRISBURG, *November 30, 1891.*

BENJAMIN LEE, *Secretary State Board of Health:*

DEAR SIR: Our citizens are compelled to drink and use very filthy water impregnated with culm from the various collieries north and east of this city, and have been doing so for some weeks, greatly to their own discomfort, and unless some decisive step is taken by the body you represent to put a stop to this continued flow of unhealthy water into the Susquehanna above the city, sickness and possibly an epidemic of disease will be the result.

I hope you will give this matter your early attention.

I remain,

JOHN A. FRITCHEY,
Mayor.

REPLY BY HOWARD MURPHY, C. E., MEMBER OF THE BOARD.

PHILADELPHIA, *December 12, 1891.*

HON. JOHN A. FRITCHEY, M. D., *Mayor, 338 S. Second street, Harrisburg, Penna:*

DEAR SIR: I have had a consultation with Dr. Leffmann to-day with regard to the condition of your water, and I am convinced that additional analyses should be made. I learned from him that the sample sent did not show any evidences of coal dust, but this was no doubt due to the location from which the sample was taken. The probabilities are that somewhere in the pipe connections with the machinery there is a place where the coal dust can settle, and it may be that the spigot from which we drew this water has not been used for some little time and that complete settlement had taken place at this point. You may remember that I rinsed the prepared bottle several times and then simply drew it full and after properly sealing up the box containing it had it expressed to Dr. Leffmann.

This analysis also has shown that the water contains a small amount of organic impurity, but as it appears that the coal dust had settled from it, this dust may have carried down with it a considerable amount of organic matter.

As you know the same roughly tested by me showed a large amount of what is evidently coal dust, and perhaps other matter, and there is no doubt in my mind that with specimens like I used Dr. Leffmann will find the dust.

He will express you this evening two demijohns specially prepared for use in shipment. In shipping these please do not use any sealing wax or other material on the stoppers of the bottles, but it would be well for you to paste slips of paper over the lid so that it could not be

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opened without detection, as samples of this kind may be tampered with in transit under the supposition that they contain liquor.

I know of no better place to get one sample than from the Bolton House, in front of which they have, I believe, a small street main from which large quantities of water are used not only in this house but in the neighborhood, keeping the water in constant circulation and therefore keeping the coal dust stirred up in it. If practicable will you kindly obtain the other sample from the intake at the pump house. The water should not come directly from the surface, but as far under as the bottle can be conveniently filled. It should not be taken from anywhere around the pumping machinery as it would be likely to contain more or less oil or grease. The man who handles these bottles should not put a greasy finger over the ends or anything of that kind, for as you very well know, a single particle of organic matter might be introduced in this way and materially affect the results. The corks should not be laid on a greasy shelf or anything of that kind as the utmost nicety is necessary in determining organic results.

I hope you will obtain one sample which comes as near as possible to containing as much coal dust as usual in any part of the city when the water is at its worst.

I hope that these samples will soon reach Dr. Leffmann so that the results may be promptly placed before you.

Yours very truly,

(Signed) HOWARD MURPHY,

Chairman Commissioner Water Supply, Drainage, Sewerage, Topography and Mines.

(c.) **Typhus Fever. Circular Sent to Destination of Immigrants.**

PHILADELPHIA, *February 16, 1892.*

DEAR SIR: Notification has been received at this office that the persons named on the enclosed list who arrived in New York per steamship "Massalia," January 30, 1892, which steamer was infected with the contagion of typhus fever, were destined for your town. It is of the utmost importance that these persons should be kept under observation for the next three weeks. Should any of them be taken ill with symptoms of fever, they should at once be quarantined for observation, and should the symptoms appear to be in the least suspicious, should either be removed to the pesthouse or strictly isolated in a lodging house.

I will ask you at once to inform me of the arrival of such persons, of

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the steps taken for their supervision, and of any case of illness occuring among them.

Yours respectfully,

BENJAMIN LEE,
Secretary.

LETTER FROM W. M. WELCH, M. D.

821 NORTH BROAD STREET, *February 21, 1892.*

DR. BENJAMIN LEE, *Secretary:*

MY DEAR DOCTOR: I think I am able to confirm the diagnosis of typhus in the case of the man sent from the Pennsylvania Hospital, but not in the case of the child sent a day or two later from its residence. Of course you will appreciate the difficulty in making a diagnosis, where a patient has been ill for twelve days and unable to furnish any reliable clinical history.

Yours very truly,

W. M. WELCH.

TYPHUS FEVER IN PHILADELPHIA.

Two sisters who had been nursing cases of typhus fever outside of the city, came to Philadelphia and were soon after attacked with the disease. After proper investigation by the medical inspector, they were removed to the Municipal Hospital, and their room was thoroughly disinfected. Another case which had previously developed apparently from contact with an immigrant recently arrived from Russia was similarly cared for. In neither instance did other cases occur. Quarantine was strictly maintained, with disinfection of the places occupied by these people.

Every immigrant from infected vessels was followed to his destination and closely watched until sufficient time had elapsed to make infection improbable. Secretary Lee notified the authorities at each point of destination, and it is regarded as positive that in no part of the State were any points of infection established.

(d.) Diphtheria from Untrapped Sewer.

LETTER FROM P. H. SAXMAN.

LATROBE, PA., *March 1, 1892.*

BENJAMIN LEE, M. D., *Secretary Pennsylvania State Board of Health, Philadelphia, Pa.:*

DEAR SIR: I write you the following soliciting your advice: I am a resident of the borough of Latrobe, Pa., and was living until the occurrence of which I write in a house on the corner of Depot and Alexan-

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dria streets, owned by Thomas G. Hughes, of Bradenville, Pa. The cellar of this house was dry and was drained into a line of pipes buried close to the gutter along the pavement. This winter a sewer was put down in the center of Alexandria and Depot streets, and the alley in the rear of the above-mentioned property. The sewer opposite was twelve or thirteen feet underground, and nine or ten feet lower than the bottom of the cellar under the house.

John Herman had the contract and put in the sewer in the middle of the streets and alley.

In the first part of January, 1892, without consulting or advising me, Mr. Hughes employed John Herman to connect the cellar of above-mentioned house and sewer. When I saw the men digging that was the first I had any knowledge they intended to connect the cellar and sewer. After the trench was dug and when they were about ready to put in the clay sewer pipes, I noticed they were all straight pieces, and there was not a trap there. I then asked Herman if they did not intend to put in a trap. He answered oh! yes; they would not put that in without a trap, and that they would attend to that and have it all secure. After having that assurance I went to my office, thinking everything would be all right. In the evening when I went home the trench was filled up and I supposed it was all right. The next day about 10 a. m. my youngest boy came to the office saying his mother wanted me to come home quick. I did so immediately, finding the house all opened up and a terrible stench in it, and the members of my family who were there sick. I asked my wife what caused the smell? She said she not know. After thinking a few minutes it occurred to me they had not put water into the trap, and was draining some old privies into the sewer. I then carried five or six buckets of water into the cellar and threw it into the drain. I still felt it coming in, and stooping down and examining found straight six-inch pipe opening into the cellar without any trap. After learning this I got my family that were there out of the house as soon as possible.

I then went to hunt up Herman (Hughes not living in town), and found them running two old privies at the public school building into the sewer. One of the privies is about 200 feet, and the other 300 feet from where the sewer is tapped for the drain from above-mentioned cellar, and from the center of street where sewer is laid to where the drain enters the cellar is twenty-five feet. The opening into this cellar is the first one below those old privies, and I believe there was no opening in the sewer above those privies at that time. I found Herman who went at once and put a trap in. I then fumigated the house and took my family back into it. After that we were all sick except my oldest boy, eleven years old, who was out sledding until the school bell rang the first time, when he went into the house but said he could not stand the smell, and took his school books, ran out and went to school. Three

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days after my oldest daughter, six years and seven months old, commenced to vomit. I called a physician. The sickness developed into malignant diphtheria and in five days she died. When she took sick there was not another case of diphtheria in town, nor had there been for quite a while, if I am informed correctly.

Feeling we were not safe in the house, I took my family to a hotel to board until I could get another house. Four days after the death of my daughter, my youngest son, over four years old, took sick with the same disease and died in fifteen days, all from the poisoning they received through negligence. We carried the body of our boy from the hotel back to the house we had lived in from where we buried him, February 2. In the afternoon after the funeral my wife and I still smelled the sewer gas. When I saw Mr. Hughes afterward I told him the sewer gas was still escaping into the house, and advised him to get it remedied or cut the connection with the sewer which he has not done. Since that time I have had a plumber examine the pipes and he says the connection is not properly made and that sewer gas is still coming into the house.

I have been advised to sue for damages and wish your advice, and write you by advice of Dr. J. D. Evans. I believe, and many others share my belief, that something should be done that will make persons having that kind of work done be careful to employ none but competent and reliable workmen, and that will prevent a repetition of the same in the future, as such negligence may cause an epidemic of sickness.

Please let this have your attention and advise me.

Truly yours,

P. H. SAXMAN.

REPLY OF THE SECRETARY.

March 4, 1892.

Mr. P. H. SAXMAN, *Latrobe, Pa.:*

DEAR SIR: I have read with intense indignation your account of the establishment of an untrapped sewer connection between your house and the street sewer. The history which you give leaves not the shadow of a doubt as to what the cause of death was. It is the duty of every borough council to protect the health of the people of the borough. No council should authorize the commencement of a sewer system, without at the same time passing strict regulations with regard to sewer connections, and making it the duty of some official to see that these regulations are properly enforced. If the council of Latrobe has failed in its duty in this respect, you have ground for a suit for damages, first against the borough. In any case you have ground for suit against the contractor and plumber, and probably against the owner of the house. As no one is so ignorant at the present day as not to know that direct connection between a sewer and a dwelling house is a certain cause of sickness generally fatal in its results. I am not a lawyer, however, and

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therefore would not undertake to advise you definitely as to just which of these parties you had better make your claim upon.

Should you take any step of this kind, I should be glad to be advised of it.

Yours very truly,

BENJAMIN LEE,
Secretary.

(e.) Leprosy Case in Philadelphia.

A case of advanced leprosy was ascertained to exist in the person of a Chinese cook working in the Peabody Hotel. After careful investigation the case was removed to the Municipal Hospital, isolated, and the hotel thoroughly cleansed and disinfected.

After a positive diagnosis had been made, the proprietor of the hotel was fined.

LETTER OF W. M. WELCH, PHYSICIAN TO MUNICIPAL HOSPITAL, 821 N. BROAD STREET.

March 7, 1892.

Dr. BENJAMIN LEE, *Secretary State Board of Health:*

DEAR DOCTOR: I think there is no doubt in regard to the correctness of the diagnosis of leprosy in the case of John Wing. It is one of tubercular leprosy advanced to the ulceration stage.

Yours very truly,

W. M. WELCH.

(f.) Pollution of Water Supply at Scranton.

LETTER FROM W. E. ALLEN, HEALTH OFFICER.

SCRANTON, PA., *March 8, 1892.*

Dr. BENJAMIN LEE, *Secretary State Board of Health:*

DEAR SIR: I am directed by the Board of Health, to ask your advice as to what course may be taken in the following matter:

The Providence Water Company, which furnishes the northern part of the city, has two reservoirs, the water from which flows in an open stream about three miles to the supply dam. Half a mile above this it passes through a farm owned by the heirs of Daniel O'Donnell, deceased. Previous to his death, O'Donnell had maintained a slaughter-house on the bank of the stream, at which a large amount of business was done at times, and by which the water was polluted.

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When remonstrated with, O'Donnell claimed that the property was his own, and the slaughter-house was established before the Water Company came into existence, and the only way in which the company could abate the nuisance would be to purchase the entire farm, for which he demanded an exorbitant price. Since his death, his heirs have pursued the same course.

As this property is beyond the city limits, outside the jurisdiction of the Board of Health, I would be glad to have you inform me whether there is any law or regulation of the State Board of Health, by which we can restrain these people.

Very respectfully,

W. E. ALLEN,
Health Officer.

REPLY OF THE SECRETARY.

March 11, 1892.

W. E. ALLEN, M. D., *Health Officer, Scranton, Pa.:*

DEAR SIR: Your favor of the 8th instant, informing me that the water furnished your city by the Providence Water Company is polluted by the drainage of a slaughter house, is received.

I suggest that your board make out a formal complaint to this Board, for which I enclose a blank. I will then send the medical inspector of the district to examine the conditions with you, and based upon his report will declare the condition a nuisance. There is no more direct way of reaching it, in the absence of any State law to prevent the pollution of streams.

Yours very truly,

BENJAMIN LEE,
Secretary.

(g.) Sewage of Reading, Berks County.

LETTER TO C. P. BASSETT, C. E., BY THE SECRETARY.

March 16, 1892.

CARROLL P. BASSETT, C. E., *Mansion House, Reading, Pa.:*

DEAR SIR: Your favor of the 14th instant, inquiring what degree of purification our Board looks upon as essential under the conditions existing at Reading before allowing the sewage of the city to pass into the Schuylkill river, is received.

I shall refer your letter at once to Howard Murphy, C. E., Chairman of our Committee on Water Supply, Drainage, Sewerage, Etc., and trust that his letter will reach you at the time desired.

I may say, however, briefly that the system should include a subsidance catch-basin, which should strain out all solids, and a filter bed of

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sufficient extent and sufficiency to notably diminish the number of bacteria. The nearest town which derives its supply of drinking water from the Schuylkill below Reading is Pottstown, distant from twenty to twenty-five miles, and of course in that distance there is opportunity for a very considerable amount of precipitation and oxidation, so that we should not feel called upon to insist on absolute purity in the effluent. As this will be one of the first attempts in the State at the purification of sewage on a large scale, and will probably furnish an example for other places, I cannot too strongly urge that you should make it as complete as is consistent with a reasonable outlay.

I shall urge Mr. Murphy to take an early opportunity of conferring with you personally on the matter.

Yours very truly,

BENJAMIN LEE,
Secretary.

(h.) Tuberculosis in Cattle.

ANNOUNCEMENT OF INTENDED SLAUGHTER OF CATTLE INFECTED.

"CLAIRMONT FARM," VILLA NOVA, *March 10, 1892.*

DEAR SIR: Dr. Leonard Pearson, Professor of the Theory and Practice of Veterinary Medicine in the University of Pennsylvania, who pursued special studies in tuberculosis in the Royal Veterinary School in Berlin, and also in Prof. Koch's laboratory, has recently discovered by the use of Koch's tuberculine, that in my herd of one hundred Jersey cattle, a large number of the finest cows have tuberculosis.

State Veterinarian Bridge, in a former examination of the herd, had condemned several cows.

To prevent the spread of the disease, and in the interest of science, I have decided to kill all of the suspected animals on Wednesday, March 16, commencing at two o'clock p. m., at my farm near Villa Nova. Pennsylvania railroad trains leave Broad street station at 12.45 p. m.

Knowing your interest in matters pertaining to public health, I will be glad to have you present at the ante and post-mortem examinations, which will be conducted by the members of the faculty of the veterinary department of the University of Pennsylvania.

Yours truly,

J. E. GILLINGHAM.

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INSPECTION OF DAIRY CATTLE.

To the Members of the Medical Profession of the city of Philadelphia:

THE FOLLOWING IS RESPECTFULLY SUBMITTED: Under a belief that the best preservation of the public health demands a more strict attention to the sources of the milk supply, I have at material expense, placed the forty-four herds of dairy cows regularly supplying me with milk, under the supervision of responsible veterinarians of excellant standing and qualification. Three inspections have been arranged for the present stabling season, viz: One in the eleventh month or twelfth month, 1891; one in the first month, 1892; and one in the fourth month, 1892. The first inspection has been completed, and with the very gratifying result of clean certificates being rendered for each of the forty-four herds. Upon the inside page will be found a statement giving the names of the veterinarians composing the corps, also the herds under the care of each. The form of certificate filled up and forwarded for each herd after each examination is as follows:

CERTIFICATE

. . . . . P. O., State of . . . . . mo, . . . 189

To GEO. ABBOTT, *Milk Dealer, of the City of Philadelphia:*

This is to certify that on the . . . . day of . . . . . , 189 , I examined the herd of milch cows owned by . . . . . and kept on farm in the township of . . . . . county of . . . . . State of . . . . . numbering . . . . . cows, and found the same, to the best of my knowledge, free from tuberculosis or other disease affecting the healthfulness as food of the milk shipped from said herd, with the following exceptions, to wit:

. . . . . .

. . . . . .

Signed, ...

A LIST OF THE NAMES AND ADDRESSES OF THE MEMBERS OF THE VETERINARY CORPS, ALSO OF THE OWNERS OF THE HERDS THAT EACH VETERINARIAN HAS IN CHARGE, TO ANY OF WHOM REFERENCE IS MADE.

R. G. Webster, V. M. D. (Graduate of the University of Pennsylvania), Media, Pa.; Edward Worth, Wawa, Pa., and 703 Walnut street, Philadelphia; Benjamin Jacobs, Norway, Pa.; E. Zook, Downingtown, Pa.; D. G. Byerly, Glen Moore, Pa.

H. P. Eves, V. M. D. (Graduate of the University of Pennsylvania), Wilmington, Delaware; John C. Higgins, Delaware City, Delaware; Henry C. Higgins, Delaware City, Deleware.

G. F. Harker, V. M. D. (Graduate of the University of Pennsylvania), Trenton, N. J.; Chas. H. Tindall, Bordentown, N. J.; William Bishop, Walnford, N. J.; John P. Hutchinson, Georgetown, N. J.

H. D. Fennimore, D. V. S. (Graduate of the American Veterinary College of New York), Burlington, N. J.; Chas. S. Taylor, Burlington,

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N. J., and 210 North Twentieth street, Philadelphia; Caleb Wood, Columbus, N. J., and 914 Pine street, Philadelphia; Caleb Hancock, Burlington, N. J.; B. F. Tallman, Columbus, N. J.: P. E. Harvey, Columbus, N. J.

J. Hume Carter, V. S. (Graduate of the Ontario College, Toronto), Mt. Holly, N. J.; John I. Bishop, Columbus, N. J.; Joseph Tallman, Columbus, N. J.; Thomas B. Harvey, Columbus, N. J.; P. E. Harvey, Columbus, N. J.; R. H. Page, Columbus, N. J.; C. M. Ingling, Columbus, N. J.; E. L. Tallman, Columbus, N. J.; J. B. Kelsey, Pemberton, N. J.

A. E. Conrow, V. M. D. (Graduate of the University of Pennsylvania), Moorestown, N. J.; Wm. M. Paul, Moorestown, N. J.; Joseph Evans, Marlton, N. J.; W. I. Tomlinson, Marlton, N. J.; E. S. Zelley, Marlton, N. J.; Ellwood Evans, Haddonfield, N. J., Clayton Haines, Medford, N. J.; Edwin Tomlinson, Kirkwood, N. J.; E. T. Gill, Haddonfield, N. J.; E. W. Coffin, Camden, N. J. Farm, Ashland Station, C. and A. R. R.

P. Peters, V. S. (late professor in the New York College of Veterinary Surgeons), Mullica Hill, N. J.; R. S. Brown, Mickleton, N. J.; S. A. Ridgeway, Woodstown, N. J.

Otto Von Lang, V. S. (Graduate of the New York College of Veterinary Surgeons, and of the Royal University of Wurtemburg, Germany), Salem, N. J.; M. J. Paulding, M. D., Daretown, N. J.; S. J. Dubois, Daretown, N. J.; S. P. Carpenter, Salem, N. J.; A. H. Weatherby, Salem, N. J.; Chas. E. Zelley, Salem, N. J.; T. B. Sunderland, Salem, N. J.; A. B. Waddington, M. D., Salem, N. J.; Richard Thompson, Salem, N. J.; Henry Bassett, Salem, N. J.; O'Brien Bros., Salem, N. J.; Richard P. Hiles, Salem, N. J.

Respectfully,

GEORGE ABBOTT,
1823 Filbert Street.

PHILADELPHIA, First month *4*, *1892*.

(1.) **Water from South Fork.**

JOHNSTOWN, PA., *May 7, 1892.*

Dr. BENJAMIN LEE, *Philadelphia, Pa.:*

DEAR SIR: To-day by express, I send you a sample of water taken from a well at South Fork, Pa. Would like you to have it analyzed for this board.

Very respectfully,

JAMES SLOAN,
Health Officer.

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Report of Analysis by Henry Leffmann, M. D.

Statement of analysis of water from well at South Fork, Pa., collected by James Sloan, Health Officer.

Condition,		Clear.
Color,		None.
Reaction,		Faintly acid.
Total solids (on evaporation),		. . . . .
Chlorides,	expressed as Cl	27.22
Ammonia by alk. permang. ("albuminoid ammonia")	" N	0.17
Ammonium ("free ammonia"),	" N	0.18
Nitrites,	" N	Present.
Nitrates,	" N	13.00
Oxygen consuming power,	" O	. . . . .
Poisonous metals,		None.
Microbes per cubic centimeter,		. . . . .

This water is contaminated and is quite unfit for use as a drinking water. I should not be surprised to find that it has been associated with an epidemic of typhoid fever.

HENRY LEFFMANN.

(k.) Floods and Fire at Oil City, Venango County.

ACTION WITH REFERENCE TO THE DISASTERS BY FLOOD AND FIRE AT OIL CREEK AND TITUSVILLE.

Intelligence of the terrible destruction of life and property at the two principal cities situated on the banks of Oil Creek, by freshet and consequent conflagration of oil tanks and refineries, reached the Secretary at Detroit early on the morning of June 6, as he was about starting for the National Conference of State Boards of Health at Lansing. He at once telegraphed to his excellency Governor Pattison, inquiring whether the information in his possession led him to consider that the interference of the State Board of Health was necessary or desirable; to the mayors of Oil City and Titusville, inquiring whether tents were needed; to the clerk in charge of the Executive Office at Philadelphia, instructing him to at once notify the Medical Inspector of the district in which these cities were situated by telegraph, to visit the same without unnecessary delay, to inspect and report; to the presidents of the boards of health of the two cities, inquiring whether they needed the assistance of this Board to enable them to meet the emergency.

The Secretary remained at the conference only long enough to be able to present the special subject assigned to him, and then returned to Detroit in order to be able to proceed at once to the scene of disaster, should the replies to his telegrams indicate the necessity for his presence. On reaching Detroit he found a telegram awaiting him from Dr. J. H. McClelland, the president of the Board, requesting him to hold himself in readiness to proceed at once to Titusville, should inquiries

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which he, the president, was presenting, make it necessary. The same afternoon a telegram was received from the Governor's private secretary, stating that the message had been forwarded to the Governor at Oil City, and the following morning replies were received from the Governor and all the other officials addressed, indicating that the local boards and authorities were fully able to cope with the emergency. The official report of Dr. A. A. Woods, Medical Inspector of the district is herewith appended.

Returning from Detroit, the Secretary visited Oil City, arriving there on the afternoon of Friday, June 10, met the mayor and the board of health, and in company with Mr. B. F. Brindred, president of the board of health, made a careful inspection of the entire disabled district, finding every provision made for the prevention of nuisances, and for the care of the injured. A request was made that the Board should furnish a ton of copperas for disinfecting purposes, but this the Secretary felt compelled to decline. At 7 o'clock the following morning, the Secretary took the construction train as far as the destroyed bridge across Oil Creek, crossing on foot a temporary trestle and walked about three miles up the track to a point where he was able to obtain a train for Titusville. He was here met at the station by Dr. Wm. Varian, president of the board of health of Titusville, who conducted him over the entire flooded and burned area.

Much admirable work had already been accomplished under the judicious administration of Dr. Varian, but owing to the immense area involved and the low lying character of the land, the drainage problem had presented considerable difficulty, and the waters of the river had only just fallen sufficiently, although six days had elapsed to enable the principal sewer to begin to do its work. The fact that all the wrecked buildings had been burned to the water's edge really left comparatively little offensive material, while in many instances collections of water which would otherwise have been offensive, were covered with a layer of oil or tar which made them entirely innocuous. At the time of my visit 400 men were on the rolls actively at work in the removal of debris, application of disinfectants, construction of temporary drains and opening of thoroughfares. No better proof can be afforded for the necessity of the establishment of boards of health in every town and village in the State than the efficient manner in which the boards of these two cities in the face of such overwhelming and bewildering disasters immediately set to work to care for the sick and injured, and to prevent the occurrence of disease, and it is sincerely to be hoped that the next Legislature will heed this lesson and make the establishment of such boards compulsory in every city and borough in the State, if not also in even unincorporated villages. A curious instance of the almost autocratic power of a health officer and the implicit respect with which his instructions are regarded in times of emergency, was afforded just after

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the arrival of the Secretary at Titusville. Just in front of a two-story frame house which exteriorly bore no evidence of having been injured by the flood, a mounted officer approached Dr. Varian and asked permission to tear the floor of the house and the board side-walk in front of it, in order to remove the offensive mud with which the cellar had been filled. Permission had been sought elsewhere but could not be obtained as the owner of the house objected to any destruction of his property. The order was at once given. Half an hour later the same officer met us at a distant point in the devasted district and gave the information that the order had been executed, and the dead body of a boy had been discovered, identified and removed for burial.

After carefully examining the causes of the disaster by fire in both of these instances, the Secretary is impressed with the fact that the individuals or companies should no longer be permitted to place oil tanks and refineries in such exposed positions on the banks of streams that they are liable, on the sudden rise of the waters, to be undermined, overturned and swept away. The unprotected oil tank close to the water is a constant menace to the neighborhood around and for miles below. This whole matter should be under governmental supervision, and the Secretary will ask that the subject be called up under the head of new business in order that the Board may take appropriate action, requesting the Governor to make special reference to this question in his message to the Legislature.

THE FLOOD AT MEADVILLE.

While at Titusville the Secretary received a telegram from the president of the board of health at Meadville requesting his presence at the place. Communication by rail being still very uncertain, the Secretary engaged a private conveyance and drove over the mountains to Oil City, reaching there in time to take the evening train for Meadville.

He found upon his arrival that while the flood at this place had left much offensive debris, the board of health had been taking admirable precautions to prevent any results prejudicial to the health of the city. An unusual source of putrefactive decay and consequent atmospheric pollution was pointed out by the president to the Secretary in a field adjacent to the railroad station. Such immense numbers of earth worms had been drowned and left upon the surface by the returning waters that they had constituted a nuisance of the most offensive character, rapidly putrifying under the intense rays of the sun. The evil had been remedied by strewing the surface with lime and then plowing it under. The object, however, for which the presence of the Secretary had been solicited, was to determine the authority of the board of health to prosecute its admirable work. Factious opposition had been made to the work and authority of the board in the city council, based upon the technical quibbles with regard to the manner of the board's appoint-

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ment. The Secretary had no hesitation in deciding that the council having once appointed the board, no informality or omission as to detail of which the council itself had been guilty, and for which it and not the board was responsible, could possibly invalidate the board's authority or jeopardise its existence. The point taken by the opponents of the board in the council, was that the ordinance creating it, while it appointed members from different districts, did not specify the districts from which the members respectively were appointed. The Secretary also expressed the opinion, in which he was sustained by a leading lawyer and ex-judge resident in Meadville, the subsequent action of the council in appointing a sanitary committee to supercede the board was illegal and subjected the council to liability of impeachment.

The conditions at this city are somewhat peculiar as regards damages from floods. A stream of considerable size draining a large area and liable to sudden freshets, persues a torturous course over a rocky bed directly under the principal business portion of the city. Considerable engineering work and pecuniary outlay will be necessary, and are essential to prevent constantly recurring catastrophes. While the Secretary strongly urged this undertaking, he was compelled to decline the request of the local board to provide any aid from the State in accomplishing it.

REPORT OF INSPECTION BY DR. A. A. WOODS.

ERIE, PA., *June 9, 1892.*

BENJAMIN LEE, M. D., *Secretary State Board of Health:*

DEAR SIR: In accordance with a telegram received by me and signed by your name from Philadelphia, I inspected the cities of Oil City and Titusville. At both places the local health boards think they are equal to the emergency.

Condition Found.—Oil City was flooded over a small area, and when I left forty-six bodies had been found. The most of these deaths were from gas explosions and fire direct, and but few from drowning. On the whole I can say that the sanitary condition resulting from the disaster at Oil City is not likely to be bad.

Titusville is in quite a different condition. There the injured district is about a mile and a half long, beginning above the city limits, extending through the town below the lower limits. The flooding here reached to the middle of the city, and hundreds of ponds and pools of stagnating water having mud and filth deposits are left with no means of drainage until such are created. This work had not been begun when I left. The devastated district in Titusville is about a mile to a mile and a half long, and through the city is about the width of four blocks, and two in other places. Through this strip nearly all their large refineries were washed or burned away. A large number of hotels, groceries, dwelling houses, etc., were burned or washed away, streets were obliterated, etc.

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There are still great windrows of debris that have not been looked over where bodies of people and carcasses of animals are certain to be found. At Oil City they have about six hundred homeless, destitute people without clothing, to feed and take care of. At Titusville they have about a thousand. Now, Oil City is about eighteen miles down Oil Creek from Titusville, and along the Oil Creek valley between the cities, bodies, carcasses, etc., are certain to be lodged. The board of health of Oil City have agreed to search the valley half way up, and Titusville will meet them there. But now Oil creek joins the Allegheny river at Oil City, and the river is still very high, though not overflowing, which it rarely does. Down the Allegheny from Oil City many bodies must have been washed and lodged at different points along the river course. I think the search for bodies along the river below Oil City and Franklin ought to devolve upon the State Board of Health. On Wednesday last while I was in Oil City we sent two men in a boat down the Allegheny to search for bodies, and they found two inside of two hours. The Allegheny river leaves my district near Emlenton, Venango county. It then runs through the edge of Clarion county, which is in another district.

I have strongly considered the advisibility of going to Franklin, and from there passing down the Allegheny in a boat with two good men familiar with the river to search for bodies and make a sanitary patrol. I have had some trouble in finding you, not knowing whether you were at Detroit or Philadelphia.

Very obediently yours,

A. A. WOODS, M. D.,
Inspector Lake District.

When I left Titusville sixty-one bodies had been found.

(1.) Slaughter-House Nuisance at Greensburg, Westmoreland County.

LETTER TO A. C. DAVIS BY THE SECRETARY.

June 28, 1892.

Mr. A. C. DAVIS, *Hempfield township, Westmoreland county, Pa.:*

DEAR SIR: Complaint having been made to this Board by ten respectable citizens of Westmoreland county in a sworn affidavit, that the slaughter-house owned and operated by you in Hempfield township, just adjoining Bunker Hill township is kept in so filthy a condition as to be a public nuisance and to endanger the health of the people. I hereby call your attention to the regulations of the State Board of Health regarding the care and management of slaughter-houses, and notify you that unless your establishment is kept clean and inoffensive in accordance with said resolutions, I shall direct the district attorney

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to prosecute you for failure to obey an order of this Board, which will subject you to a penalty of one hundred dollars for each such offense.

Yours respectfully,

BENJAMIN LEE,
Secretary.

REPLY BY A. C. DAVIS.

GREENSBURG, PA., *July 8, 1892.*

Dr. B. LEE:

DEAR SIR: I have removed all bones and will keep them away, and offal also, am getting the place whitewashed and will keep it properly cleaned. Please send any person you choose to examine the place. You can refer to Dr. H. G. Lomison, of Greensburg, the gentleman will examine and answer you. I will try and go by your regulations.

Yours respectfully,

A. C. DAVIS.

(m.) Destroying Soiled Articles of Clothing.

LETTERS FROM DR. E. C. TOWN.

PHILADELPHIA, *July 2, 1892.*

Dr. BENJAMIN LEE, *Secretary State Board of Health:*

DEAR SIR: I beg to report that on July 1, 1892, I destroyed one hundred and thirty-eight (138) articles of suspicious and dirty clothing and about one hundred and fifty (150) pairs of gloves that had been left in Broad street station, and had accumulated since April, 1892.

Respectfully yours,

E. C. TOWN, M. D.,
Special Inspector for P. R. R.

PHILADELPHIA, *August 31, 1892.*

BENJAMIN LEE, M. D., *Secretary State Board of Health:*

DEAR SIR: I beg to report that I destroyed on August 31, 1892, at Broad street station, Philadelphia, one hundred and fifty-two (152) articles of soiled and dirty clothing which had been found on the property of the company.

Respectfully yours,

E. C. TOWN, M. D.,
Inspector for P. R. R. of State Board of Health.

PHILADELPHIA, *September 2, 1892.*

Dr. BENJAMIN LEE, *Secretary State Board of Health:*

DEAR SIR: I beg to report that two hundred and six (206) packages of dirty and soiled clothing were burned by my direction at Broad street station to-day.

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I have sent you three reports of articles destroyed within a few weeks, but have as yet received no communication from you approving of my action.

I should like to know if what I am doing is all right.

Respectfully yours,

E. C. TOWN, M. D.,

Inspector of State Board of Health for P. R. R. Company.

PHILADELPHIA, *September 17, 1892.*

BENJAMIN LEE, M. D., *Secretary State Board of Health:*

DEAR SIR: I beg to report that I had destroyed at Broad street station, Philadelphia, on September 16, twenty-three (23) packages of dirty clothing, six (6) valises, one (1) box and two (2) baskets.

Respectfully yours,

Dr. E. C. TOWN,

Inspector of State Board of Health for P. R. R.

(n.) Small-pox Body not to be Disinterred.

Information having been received that a body of a small-pox patient was about to be disturbed at Mill Creek, Luzerne county, the following telegram was at once sent:

July 29, 1892.

O. B. MCKNIGHT, *Poor Director, Mill Creek, near Wilkes-Barre:*

The State Board of Health forbids the body of J. R. to be disinterred. Arrest any one attempting it.

BENJAMIN LEE,

Secretary.

(o.) Destruction of Forests.

LETTER TO HON. A. S. PADDOCK.

PHILADELPHIA, *August 2, 1892.*

Hon. ALGERNON S. PADDOCK, *United States Senate, Washington, D. C.:*

SIR: I am instructed by the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, to transmit to you a copy of the following resolution adopted at a regular meeting held at Harrisburg, July 11, 1892.

Very respectfully,

BENJAMIN LEE,

Secretary and Executive Officer.

Resolved, That the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania desires to express its appreciation of the efforts of the Hon. Algernon S. Paddock, Senator of the United

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States, for his intelligent, energetic and successful support of the measure to protect the forests of this country from ruthless destruction, believing that the question is not simply one of dollars and cents, but that it is fraught with consequences of the greatest moment to the health and lives of our people. Our own State affords a conspicuous example of the increased tendency to devastating floods in consequence of the denudation of mountains of their native growths. The thanks of this Board are due, and are hereby tendered to the honorable Senator for his part in urging this much-needed reform.

(p.) Dam Commission Requested of the Governor.

PHILADELPHIA, *August 2, 1892.*

To His Excellency ROBERT E. PATTISON, *Governor of Pennsylvania:*

SIR: I am instructed by the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, to transmit to you a copy of the following resolution adopted at a regular meeting held at Harrisburg, July 11, 1892.

Very respectfully,
BENJAMIN LEE,
Secretary and Executive Officer.

Whereas, A communication from His Excellency the Governor concerning the inspection of dams has been presented by the Secretary, and

Whereas, It has been the special duty of the Board to become particularly familiar with the very serious unsanitary conditions which have been created by the failure of dams, and the lack of provision of adequate channels for the carriage of stormwater, as in the case of Johnstown, Oil City, Titusville, etc.

Resolved, That the Board heartily approves of the proposed creation of a commission to inspect the dams and wasteways of the State as a sanitary precaution, but as so many other than sanitary questions are involved, such as the loss of life and property, etc., that they would respectfully suggest to His Excellency the Governor that a communication to this effect emanate from him.

(q.) Small-pox at Bunola, Allegheny County.

TELEGRAM FROM MEDICAL INSPECTOR J. R. THOMPSON.

PITTSBURG, *August 1, 1892.*

Dr. B. LEE, *Secretary, etc.:*

Letter from physician announcing small-pox at Bunola, Allegheny county. Instruct.

J. R. THOMPSON,
Medical Inspector.

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REPLY OF SECRETARY.

PHILADELPHIA, *August 1, 1892.*

DR. J. R. THOMPSON:

Visit case in Allegheny county, quarantine and order vaccination. Report at once.

BENJAMIN LEE,
Secretary.

LETTER FROM DR. C. H. SHAFFER.

ELIZABETH, PA., *August 1, 1892.*

BENJAMIN LEE, *Secretary:*

DEAR SIR: I have a case of variola at Bunola, near Elizabeth, and for three days a case has been wandering about our streets. There is a likelihood of further infection and I shall be glad to have instructions as to power to enforce quarantine, etc. Be kind enough to let me hear at once.

Respectfully, etc.,

CHARLES H. SHAFFER, M. D.,

I am out-door physician to county poor board.

INSPECTION AT BUNOLA, ALLEGHENY COUNTY.

By J. R. THOMPSON, *Medical Inspector*, on account of rumor of small pox.

PITTSBURG, *August 2, 1892.*

To the Secretary of the State Board of Health:

SIR: I have the honor to report that I visited Bunola, on August 2, 1892, and found the following conditions to exist: Population of the town about 600. Not incorporated. Squire, David P. Byers. Drainage, surface. Water supply from springs and wells. Diagnosis made by Dr. C. F. Highbee, of Shire Oaks, Washington county (a town on the southwest bank of Monongahela river just opposite Bunola), and diagnosis corroborated by myself through visiting the patients bed side, one case.

Patient is in the ninth day of his sickness. Confluent as to the face. Precautions: vaccination. Flags placed at proper limits. Sign "small-pox" placed on the house; occupants of the house seven, including the nurse. All vaccinated in the old country (Belgium). Patient vaccinated three times with no effect. Ordered stools buried and house fumigated.

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PITTSBURG, *August 3, 1892.*

DEAR DR. LEE: The recommendations in this case are that Allegheny county assume the care of the case and that Captain Glenn, of the county poor farm be notified to that effect. He has already taken partial action, allowing ten dollars for ten days for nurse and provisions. You will perceive this is inadequate. Dr. C. H. Shaffer, of Elizabeth, is the district physician for the county.

Very respectfully yours,

J. R. THOMPSON,
Medical Inspector.

Letter to Overseer of Poor, Allegheny County.

PHILADELPHIA, *August 23, 1892.*

To the President of the Board of Overseers of the Poor of Allegheny county:

DEAR SIR: While congratulating your honorable board on the efficient steps taken by them to prevent the spread of small-pox at Bunola, it is my duty to remind you that the most dangerous time for the community is when the active stage of the disease is over and the convalescents began to mix with the community again. I call your attention particularly to the instructions for disinfection of house, effects and clothing. All clothing that cannot be boiled should be burned, and if the patients are too poor to bear the loss, the county should furnish them with new clothing to take the place of that which has been destroyed. All bedding used by them should be burned. It will cost the county much less to attend to this matter of precaution now, than to have a dozen fresh cases of the disease to care for. Trusting that you will give this subject early and earnest attention, and be guided by the advice of your county physician. I am,

Yours respectfully,

BENJAMIN LEE,
Secretary.

(r) Tuberculosis in Penal Institutions.

CIRCULAR LETTER TO THE SUPERINTENDENTS OF JAILS.

SIR: At the last regular meeting of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, I was instructed to call your attention to the fact that statistics show that consumption of the lungs or tuberculosis prevails to a large extent in penal institutions. Recent medical discoveries have established to the satisfaction of the great body of the profession and of this Board, that the disease named is communicated by infection, and that this infection is liable to adhere to walls, clothing and furniture, and may retain its vitality for a long period. The circular which I enclose by order of the Board

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states more at length the conditions of communication, and the precautions necessary to be taken to prevent its spread. It is believed that careful compliance with its suggestions will entirely prevent the disease from spreading in any institution. The Board earnestly urges, therefore, that you will provide the necessary facilities for carrying them out, and insist on compliance with them on the part of any of your inmates affected with this disease.

I shall deem it a favor if you will furnish me the statistics of your institution, so far as they have been kept, with regard to the number of cases and deaths which have occurred in your institution from this disease, and their ratio to those from other diseases.

I have the honor to be,

Yours respectfully,

(Signed) BENJAMIN LEE,

Secretary.

August 25, 1892.

REPLIES OF SUPERINTENDENTS.

Bucks County.

DOYLESTOWN, *August 31, 1892.*

We have had no death of any kind during the last year at this place, and not a consumptive at present to the best of my knowledge.

JESSE L. ALLEN.

Cameron County.

EMPORIUM, *August 31, 1892.*

We have a very small jail and a very small county. I have kept the jail for ten years, and we never had but one death in the jail and that from a fit. Never had a consumptive in that I know of. Sheriff Smith died four years ago at the jail of consumption.

P. E. LEWIS.

Cambria County.

EBENSBURG, *August 30, 1892.*

I have been in charge four years, and have not had one serious case of sickness nor any death. We average about fifty prisoners in that time. I have not had a case of consumption yet. Our jail is well ventilated and the cellar is dry. We are careful that the prisoners keep their windows open to admit plenty of fresh air.

JAS. T. YOUNG.

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Carbon County.

MAUCH CHUNK, *August 31, 1892.*

In reply will say there has not been a death in our jail for twenty-five years.

J. S. WEBB.

Fayette County.

UNIONTOWN, *August 31, 1892.*

There have never been any deaths in our institution from any disease. We have only one case as far as known; he was confined for eight months; had the consumption badly on entering; much worse when discharged; died last month.

GEORGE A. MCCORMICK.

Indiana County.

INDIANA, *August 29, 1892.*

Very little sickness at any time. Never knew of a death here.

H. P. LEWIS.

Lawrence County.

There have been no deaths in the jail since I took charge January, 1892, nor any one suffering from pulmonary disease.

WM. DOUTHETT.

Sullivan County.

LAPORTE, *September 12, 1892.*

No deaths in our jail for the past five or six years.

JOHN UTZ.

Wayne County.

HONESDALE, *September 6, 1892.*

No cases in this jail since I have had charge.

J. W. KIMBLE.

(s.) **Dumping of Garbage.**

PITTSBURG, *September 20, 1892.*

DR. BENJAMIN LEE, *Secretary State Board of Health, 1532 Pine Street, Philadelphia:*

DEAR SIR: I beg leave to acknowledge the commission appointing me health officer of Allegheny county, and to say that I accept the same and will endeavor, to the best of my ability, to perform all the duties that may be required.

In this connection I would state that at present all the garbage, cesspool matter, etc., is taken below the city and dumped into the pool caused by the Davis island dam. In my opinion it should be taken below the dam and dumped into the river, where there is a swift current, as the wickets are not let down for months at a time, and the current being very slow—not over half a mile an hour—it remains in this pool and must contaminate water up as far as the water pipes of

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the city. I wish you would advise me in reference to this—what the city could or ought to do, and greatly oblige,

Respectfully yours,

J. O. BROWN,
Chief Department Public Safety.

LETTER BY SECRETARY.

October 15, 1892.

Mr. J. O. BROWN, *Chief of Department of Public Safety, Pittsburg, Pa.:*

DEAR SIR: Referring to your favor of September 20, which would not have remained so long unanswered but for excessive pressure of duties in connection with the cholera excitement and lack of clerical assistance. I would say with reference to the question suggested as to the present manner of disposal of the garbage, cesspool matter, etc., of your State, that I consider the dumping of such material into a dam with a very slow current extremely dangerous. I took especial pains to observe the current in the Allegheny river on the occasion of my last visit to Pittsburg, and I should say that at the point at which I observed it instead of half a mile an hour it could not have been the twentieth of a mile an hour. Under these circumstances the opportunity for exudation amounts to almost nothing. The material must become more or less decomposed and putrid, and although the water supply of Pittsburg is so far up the stream that it is probably out of danger proper as far as this coast is concerned, yet the entire mass of water in the dam must become contaminated, and the emanations from it must be imminently unwholesome.

In my judgment, therefore, the present disposition of the filth of the State must be absolutely condemned. It should either be removed below the dam where a swift current will afford an opportunity of gradual oxidation, or subjected to rapid oxidation in the crematory.

With the facilities which you already have in Pittsburg for the cremation of such material, I am surprised that the other method should ever have been adopted.

Mr. Gray writes me that the blank orders for abatement which I sent you did not have my signature as I intended. I therefore ordered some more sent you at once.

Yours very truly,

BENJAMIN LEE,
Secretary.

(t.) Sanitation in Railroad Construction.

FROM WILKES-BARRE AND EASTERN RAILROAD COMPANY.

October 11, 1892.

Dr. BENJAMIN LEE, *Secretary State Board of Health, 1532 Pine Street, Philadelphia:*

DEAR SIR: Your favor of October 5 in relation to sanitary arrangements connected with the construction of the Wilkes-Barre and Eastern

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railroad, is just at hand. I have already had some correspondence with Dr. Charles McIntire, of Easton, Pa., on the same subject, and sent him a list of all the contractors along the line of this road and their addresses some time ago. I have not since heard anything from him. I do not know any physician along the line of the road whom I would care to name for appointment as special medical inspector. I have had some talk with Dr. Taylor, the representative of your Board in this city, who seems to think that the principal danger now would be a contamination of sources of water supply with typhoid fever germs. The only place that I can now think of where this trouble is likely to occur would be on the Spring Brook Water Shed, about thirteen or fourteen miles from here. It has occurred to me that Dr. Taylor would be best able to make the necessary examinations there. I would be glad to co-operate in any way I can to aid you in this matter, though I am inclined to think it is a subject that should be brought directly to the attention of the contractors along the line of the road, as we have no power to control their actions in matters of this kind. I send you herewith the names and addresses of all the contractors along the line of this road.

Very sincerely yours,

W. P. RYMAN,
President.

NOTICE TO CONTRACTORS.

PHILADELPHIA, *October 26, 1892.*

DEAR SIR: I desire to call your attention as a contractor on the Wilkes-Barre and Eastern railroad to the importance of unusually strict sanitary precautions in regard to the habits of your workmen and laborers in consequence of the danger of the arrival of cholera in this country from Europe. At every point where your men encamp for any length of time you should have garbage pits and cesspools distant at least a quarter of a mile from any running stream. These should each day have fresh, clean earth mixed with quicklime thrown upon the deposit of the previous day, and when the entire deposit has reached within six inches of the surface should be covered completely with fresh earth and lime up to the surface level. You should insist on these conveniences being made use of by the men, and discharge upon the spot any who are careless in these respects.

Yours very respectfully,

(Signed) BENJAMIN LEE,
Secretary.

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APPENDIX D.

REPORTS OF CONFERENCES AND CONVENTIONS.

1. Report of a Conference of State and Municipal Boards of Health held at Chicago, January 14, 1892, with a View to Arranging for an Exhibit of the Official and Sanitary Work of the Country at the World's Columbian Exposition.
2. The Opening of the Institute of Hygiene at the University of Pennsylvania, February 22, 1892.
3. Proceedings of the State Sanitary Convention held at Erie, March 29, 30, 31, 1892.
4. Conferences of Boards of Health held at Lansing, Michigan, June.
5. Report of the Secretary as Chairman of the Section on State Medicine of the American Medical Association, held at Detroit, Michigan, June.
6. Conference of the State Boards of Health of Pennsylvania, Ohio and West Virginia, held at Pittsburg.
7. Conference with the Philadelphia Board of Trade.

1. MINUTES OF A CONFERENCE OF STATE AND MUNICIPAL BOARDS OF HEALTH, HELD AT CHICAGO, THURSDAY, JANUARY 14, 1892, WITH A VIEW TO ARRANGING FOR AN EXHIBIT OF THE OFFICIAL SANITARY WORK OF THE COUNTRY AT THE WORLD'S COLUMBIAN EXPOSITION.

In response to a suggestion of the State Board of Health of Pennsylvania, a conference of representatives of State and Municipal Boards of Health was held at the Grand Pacific Hotel, Chicago, Thursday, January 14, at 10 a. m. There were present the following secretaries or representatives of State Boards of Health, viz:

Dr. H. B. Baker, Michigan; Dr. F. W. Reilly, Illinois; Dr. J. T. Reeve, Wisconsin; Dr. H. H. Clark, Iowa; Dr. C. McClellan, Provincial Board of Health of Ontario; Dr. John H. Rauch, representing the American Public Health Association; Dr. C. D. Smith, Maine; Dr. M. O'Brien, Kansas; Dr. C. N. Hewitt, Minnesota; Dr. S. P. Wise, Ohio; Dr. C. N. Metcalf, Indiana; Dr. Benjamin Lee, Pennsylvania

The following representatives of Municipal Boards of Health: Hon. Peter Rush, Controller of the city of Detroit; Dr. J. H. D. McShane, Health Commissioner, Baltimore; Dr. John D. Ware, Commissioner of Health, Chicago; Dr. D. S. Shellabarger, Health Commissioner, Sioux

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City; Dr. U. O. B. Wingate, Commissioner of Health, Milwaukee; Dr. Jamin Strong, Board of Health, Cleveland; J. H. Kellog, Esq., Secretary, Department of Health, Chicago.

Letters or telegrams, expressing sympathy with the movement, regretting inability to be present, and promising the hearty co-operation of their respective Boards in any plan of exhibit which the Conference might devise, were received from the following Secretaries of State Boards of Health:

Dr. J. H. Hamilton, Vermont; Dr. N. D. Baker, West Virginia; Dr. J. Y. Porter, Florida; Dr. C. A. Lindsley, Connecticut; Dr. T. F. Wood, North Carolina; Dr. Jerome Cochran, Alabama; Dr. C. N. Fisher, Rhode Island; Dr. J. H. McCormack, Kentucky; E. B. Frazer, Esq., Delaware; Dr. C. W. Chancellor, Maryland; Dr. J. A. Overstreet, Oklahoma Territory; Dr. E. Pelletier, Province of Quebec; Dr. L. F. Salomon, Louisiana; Dr. C. N. Hammett, District of Columbia; Dr. S. W. Abbot, Massachusetts.

And from the following representatives of Municipal Boards of Health: Crosby Gray, Esq., Bureau of Health, Pittsburg; Dr. Ernest Winter, Board of Health of Buffalo; Dr. J. W. Prendergast, Health Officer, Cincinnati; Dr. H. B. Horlbeck, Commissioner of Health, Charleston; Dr. S. J. Finney, Commissioner of Health, St. Louis; Emmons Clark, Esq., Secretary Board of Health, New York; Dr. William H. Ford, President Board of Health, Philadelphia; Dr. James W. Keeney, Health Officer, San Francisco; Dr. Welsh, President Board of Health, Grand Rapids; W. P. Dunwoody, Esq., Secretary National Board of Health; Dr. R. Harvey Reed, Health Officer, Mansfield, Ohio.

On motion of Dr. Benjamin Lee, Dr. John H. Rauch was called to the chair. Dr. Lee was elected Secretary.

The Chairman called upon the Secretary to state the object of the meeting. The Secretary accordingly read a copy of a letter from Dr. Rauch to the Director General of the Exposition, as follows:

"COLONNADE HOTEL, PHILADELPHIA, PA.,
"*January 7, 1892.*

"Hon. GEO. R. DAVIS, *Director General Columbian Exposition, Chicago,*
"*Illinois:*

"DEAR SIR: His Excellency the Governor of Pennsylvania, desiring to have the interests of his State presented in the fullest manner at the World's Columbian Exposition, communicated with Dr. Benjamin Lee, Secretary of the State Board of Health, requesting that the work of the Sanitary Department of the Commonwealth should be brought to the attention of the public on that occasion in some fitting manner.

"Dr. Lee, feeling that the exhibit or presentation of the work of a single State or Board would not be of sufficient interest and importance to attract general attention, considered it expedient to communicate with the Secretaries of State and Municipal Boards of Health, and with my-

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self, as Chairman of the 'Committee of the American Public Health Association, to co-operate with the Exposition Commission,' with a view to obtaining such a general presentation of the organization and methods of the various sanitary bodies of the country, as would be both interesting and profitable.

"As a result of this interchange of views, it has been decided to hold a Conference of Sanitarians, generally representatives of official bodies, at Chicago, on Thursday, January 14, 1892. I feel it to be important that your commission should participate in this meeting, and trust you will be represented. It will be held at the Grand Pacific Hotel and will convene at 10 a. m.

"Very truly yours,

"(Signed) JOHN H. RAUCH."

To the above letter the following reply was received:

"OFFICE WORLD'S COLUMBIAN EXPOSITION,

"*Chicago, Ill.*

"Dr. JOHN H. RAUCH, *Springfield, Ill.:*

"SIR: I am in receipt of your favor of January 7, advising me of the proposed Conference of Sanitarians at Chicago, January 14, and I shall take pleasure in arranging to have some representative of the Exposition present at the meeting.

"I have referred your letter to Dr. S. H. Peabody, Chief of the Department of Liberal Arts, with the request that he give it his personal attention.

"Thanking you for your interest in this branch of the Exposition work, I am,

"Very respectfully yours,

"(Signed) GEO. R. DAVIS,

"*Director General.*"

The Secretary considered that the above letters stated succinctly the objects of the Conference

When called upon by the Governor of his State for a sanitary exhibit, he had felt entirely at a loss as to what suggestions to make. Since coming to Chicago, he had conversed with members of other Boards, and found that they had experienced the same difficulty. Interviews had taken place between Dr. Rauch and himself and the President of the Executive Department of the Exposition, the President of the Department of Liberal Arts and the President of the Department of Auxiliary Congresses, which showed that while those who were commercially interested in sanitary appliances, had been prompt in their applications for space, so that there would be a complete and valuable exhibit of such articles, the scientific aspect of sanitary work had as yet received little attention. He felt convinced that the officers of the Exposition would be only too glad to have the aid of this Conference in arranging that branch of the exhibition.

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Dr. Hewitt, of Minnesota, then briefly stated the work done by the Committee of the American Public Health Association, appointed at the last meeting to "arrange for the meeting of 1893, and to make the occasion, as far as possible, an International Congress of Hygiene and Public Health." He considered it a matter of much importance that any action taken at this Conference should be in harmony with the general plan to be adopted by the committee referred to.

The question of the proper mode of raising funds for the exhibits of the several States was suggested by Dr. O'Brien, of Kansas, and discussed by Drs. Baker, of Michigan, Smith, of Maine, and others, who agreed that, after the action of this Conference and the suggestion of some definite plan by it, there would probably be no difficulty in obtaining a portion of the general appropriation of their States for the Exposition.

The Chairman stated that the President of the Executive Department of the Exposition, William T. Baker, Esq., had courteously offered the use of the Directors' Room for the meeting and some of the officers had accepted an invitation to be present. As the time fixed for meeting those gentlemen had already passed, he suggested that it would be well to adjourn to that place. On motion, the conference therefore adjourned to meet at once at the Directors' Room.

On re-assembling, the Chairman presented a copy of the official organization and schedule of exhibits ot the Exposition, and at his request that portion which referred to hygiene and sanitation was read by Dr. McShane, of Baltimore.

The Chairman also presented a copy of the schedule of exhibits of the Museum of Hygiene held in connection with the meeting of the American Public Health Association in Brooklyn.

Dr. S. H. Peabody, Chief of the Department of the Liberal Arts, having arrived, was presented to the Conference, and expressed his satisfaction that the sanitary officials of the country were coming to his aid in this important department, and his readiness to answer any questions that the members might suggest. He had as yet insufficient data for determining what space would be needed for the sanitary exhibit, and hoped that he should gain some definite information from this body on that point. The classification which had been adopted by the Commission and which had just been read he considered covered all the essentials. It was, however, open to re-arrangement, and he would be glad to receive any suggestions for this purpose which the Conference might offer.

Dr. H. B. Baker inquired whether the official classification included the work of State and Municipal Boards of Health, affording an opportunity for the exhibition of illustrative charts and diagrams by which alone such work could be demonstrated to the eye of the visitor.

Dr. Peabody replied that this would constitute one of the most im-

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portant parts of the exhibit, and although not yet directly mentioned in the schedule, place would certainly be made for it. As regarded the size of the charts which would be allowed and the mode of their display, he stated that in educational work it had been decided to use for this purpose cards of a uniform size, viz: 22x28 inches, arranged in alcoves, at such a height that they could be easily read, and also cards, diagrams and maps, which could be hung on wing frames.

Dr. Hewitt considered that the exhibit of sanitary appliances, commercial in their character, should be entirely distinct from the strictly scientific sanitary exhibit of State and Municipal Boards of Health, while at the same time, for convenience of visitors, it might be well to have space assigned for such appliances somewhat in the same neighborhood. The same gentlemen inquired at what time such exhibits as those of the processes and results of bacteriological investigations should be presented. He made this inquiry because such exhibits were perishable in their nature, and would require the constant presence of an expert.

Dr. Peabody replied that it was extremely desirable that all exhibits should be ready at the opening of the Exposition, and suggested that in view of the difficulty mentioned by Dr. Hewitt, the attempt should be made to have successive exhibits of this kind, superintended by scientific experts detailed by the different physiological, biological and hygienic laboratories throughout the country.

The Secretary called attention to the fact that certain boards of health had in operation sanitary appliances which were not patented, which they might desire to exhibit, and which would be of great interest, such for instance as the disinfecting apparatus of the seaboard quarantine stations. Other boards were conducting experiments of great importance, such as that of the Massachusetts State Board on the filtration of water and sewage, for demonstration of which, either by working models or on a large scale, space might advantageously be granted.

Dr. Smith then moved that the Chair appoint a committee of such number as he may deem expedient to formulate a uniform plan for demonstrating the organization, methods, and results of the work of State and Municipal Boards of Health at the World's Columbian Exposition, and to report the same to each member of the conference and to all State and Municipal Boards of Health interested in the movement.

It was carried.

On motion of Dr. Lee, it was *Resolved:* That this conference desires to co-operate in the fullest manner with "the Committee of the American Public Health Association to arrange for the meeting of 1893, and to make the same, so far as possible, an international congress of hygiene and public health."

Dr. H. B. Baker moved that it is the sense of this conference that there should be a *collective* exhibit of the work of State and Municipal

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Boards of Health at the World's Columbian Exposition. The motion was seconded by Dr. Hewitt, who considered that this need not in any way interfere with the sanitary exhibit of any State in its own building, if the authorities of such State so desired. Dr. Peabody said that so far as the directors of the exposition were concerned, it was certainly their wish and intention that the sanitary exhibit should be a collective one. He felt that if exhibits of this character were scattered throughout the entire exposition, they would fail to be appreciated, and would certainly lose their educational value. The motion of Dr. Baker was then put and unanimously carried.

After accepting a courteous invitation from Dr. Peabody to visit the grounds of the exposition under his personal guidance, the conference then adjourned.

BENJAMIN LEE,
Secretary.

Note.—The committee appointed by the chairman to formulate a uniform plan of exhibit, is as follows:

Dr. Benjamin Lee, Secretary State Board of Health of Pennsylvania, *Chairman.*

Dr. Henry B. Baker, Secretary State Board of Health, of Michigan.

Dr. Franklin Staples, President State Board of Health of Minnesota.

Dr. J. T. Reeve, Secretary State Board of Health of Wisconsin.

Dr. J. F. Kennedy, Secretary State Board of Health of Iowa.

Dr. F. W. Reilly, Secretary State Board of Health of Illinois.

Dr. C. N. Metcalf, Secretary State Board of Health of Indiana.

Dr. Chas. McClellan, President Association of Executive Health Officers of Ontario.

Dr. William H. Ford, President Board of Health of Philadelphia.

Dr. U. O. B. Wingate, Health Commissioner of Wilwaukee.

Dr. John D. Ware, Commissioner of Health of Chicago.

The Committee of the American Public Health Association "to ar-arrange for the meeting of 1893 in the city of Chicago, and to make it as far as possible an International Congress of Hygiene and Public Health," is as follows:

Dr. John H. Rauch, Springfield, Illinois, *Chairman.*

Dr. A. N. Bell, Brooklyn, New York.

Dr. Samuel W. Abbot, Wakefield, Massachusetts.

Dr. Peter H. Bryce, Toronto, Ontario.

Dr. Charles N. Hewitt, Red Wing, Minnesota.

Dr. Lucien F. Salomon, New Orleans, Louisiana.

Dr. H. D. Fraser, Charleston, South Carolina.

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2 THE OPENING OF THE INSTITUTE OF HYGIENE AT THE UNIVERSITY OF PENNSYLVANIA.

No department of the science of medicine, in its broader sense, has made more rapid strides within the past twenty years than that whose aim is to do away, as far as possible, with medicine as conceived by the narrow-minded practitioner—that is to say, with medication. It is not long since the phrase, *State Medicine*, conveyed no definite idea to our minds. There was no such thing as hygiene in the curriculum of the college which graduated the *vieux moustache*, who is still actively engaged in the practice of his profession. At the present time, however, not only does no first-class medical school dare to issue a prospectus which does not give considerable prominence to this subject, but those which lead the van are seeing the wisdom, and, indeed, the necessity of advancing it to the dignity of a distinct department, with its own corps of instructors, its own building and its own machinery.

The first university in the country to take active steps to establish a Laboratory of Hygiene was that of the State of Michigan. At the instance of the State Board of Health, the Regents of that body petitioned the Legislature for an appropriation for this purpose in the year 1886. In compliance with this request, the sum of $35,000 was voted for the construction of the building and a modest annual stipend assigned for its maintenance. The edifice was completed and occupied in 1888, although educational and scientific work was begun a year earlier. This was the pioneer in the United States of institutions having for their object:

(1). Original investigation into the causation of disease.

(2). The examination of samples of food and drink, at a nominal cost, for the protection of the public health; and

(3). The instruction of students in hygienic investigation.

Of course, there had been biological laboratories and physiological laboratories, and even bacteriological laboratories, in which researches had been prosecuted, more or less directly bearing upon the problems of hygiene. The State Board of Health of Massachusetts had its own hygienic laboratory, munificently supported by the State, but the educational idea had no part in its conception.

Let it not be supposed, however, that the urgent necessity for such a foundation, which should be at once a factor in the development of the science and practice of the art of sanitation, and an educational center from which should go forth a body of thoroughly-equipped sanitarians to succeed to those who, with imperfect training and incomplete armament, have been carrying on unequal warfare against the hosts of disease—let it not be supposed, we say, that this necessity had not already

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suggested itself to the sagacious men composing the Board of Trustees of the University of Pennsylvania. The Chair of Hygiene had been a prominent one in their Auxiliary Faculty of Medicine twenty years before. Had it been possible for them to have appealed to the Legislature of the State for means to inaugurate this important undertaking, they would long before have taken the initiative. But, unfortunately, the fundamental law of the Commonwealth expressly forbids the devotion of the public funds to any such purposes There was no resource, therefore, but to bring the want to the notice of Philadelphia's public-spirited men, and wait patiently until the seed thus sown should bear fruit. This fruitage is seen to-day in the completed building which, through the munificence of Mr. Henry C. Lea, at a total expenditure of $200,000, now stands ready, equipped with every essential appliance, officered by men of national reputation and proved ability, to receive its rite of dedication and enter upon its career of usefulness.

The day on which we fondly remember him who was first in peace as well as in war, and to whom the arts protective were ever dearer than those destructive of life, was not inappropriately chosen for this occasion. Those who participated in it enjoyed an opportunity of inspecting a school of hygiene which, for ampleness of accommodation, convenience of arrangement, adaptability to its special purposes and completeness of equipment, is without a peer in this country and probably in the world. For, as has been said, there is but one other institute of this kind devoted solely, exclusively to sanitary development on the American continent, and that has had a much smaller amount of money at its disposal.

Similar laboratories in Europe have, as a rule, grown by gradual accretions, and do not, therefore, present the same systematic and well-designed plan as if they had been erected for the purpose at the outset. Many of them are dark, gloomy and ill-ventilated. That of the famous Pettenkofer has been aptly described as a den in an attic. That of Pasteur, on the other hand, the gift of admiring friends all over the world, while far surpassing this in costliness, presents a succession of magnificent corridors, spacious antechambers and luxurious audience halls, to provide which utility, convenience and comfort have been greatly sacrificed.

Especially to be remarked in the building which has just been opened is the careful utilization of room, the floods of light, the abundance of fresh air and the absence of architectural effort and meretricious decoration. Its style is severely simple. It means business. Each student will have ample space for manipulation, and be fully supplied with every necessary appliance. But this undertaking cannot in the nature of things, at least for many years to come, be self-supporting. The noble benefaction recorded above must be duplicated—aye, quadrupled—to enable this work, the importance of which, in its far-reaching char-

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acter, to the city of Philadelphia and the State of Pennsylvania, cannot be overestimated, to be prosecuted to the full extent of its capacity for usefulness. We cannot doubt that there are men emulous to have their names go down to posterity enrolled on the same scroll with that of the modest but profound scholar and wise philanthropist whose gift has just been received by his University and city with such marked expressions of gratitude.

BENJAMIN LEE,
Secretary.

OPENING EXERCISES OF THE INSTITUTE OF HYGIENE OF THE UNIVERSITY OF PENNSYLVANIA.

I. CEREMONIES AND ADDRESSES OF THE OPENING OF THE INSTITUTE.

This laboratory was opened February 22, 1892, with the following ceremonies:

Prayer by the Rev. Dr. George Dana Boardman.

Presentation of the new building to the provost and trustees by S. Weir Mitchell, M. D., Chairman of the Committee on Hygiene.

Acceptance on behalf of the provost and trustees by Provost William Pepper.

Address by Dr. Benjamin Lee, Secretary of the State Board of Health.

Address by Dr. John S. Billings, Director of the Institute.

Address by Dr. H. P. Walcott, President of the Massachusetts State Board of Health, followed by inspection of the new Institute of Hygiene.

Address on Opening of the Institute of Hygiene of the University of Pennsylvania, Delivered February 22, 1892, at the Library of the University of Pennsylvania.

ADDRESS BY S. WEIR MITCHELL, M. D., LL.D., HARV., CHAIRMAN OF COMMITTEE ON HYGIENE.

I appear before you to-day officially as Chairman of the Committee on Hygiene of the University of Pennsylvania. I am here also to rep-

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resent my friend, Henry Charles Lea, that I may make over to the trustees the completed laboratory which he has built for the teaching and study of hygiene.

This, my very pleasant task, shall be brief. I am about, Mr. Provost, to give you another man's gift. For the moment I am the owner. A faint, a subtle sense of the joy of being able, aye, more, of being willing to give, on a scale so royal, comes to me as I think of what I am about to do. I realize the honest joy such bounty brings to him who gives. I assure you that it fills me with an ardent, a philanthropic desire that more of you should share the delight of liberal giving to this ancient school of learning.

All that I might say as to the need for teaching and research in hygiene will be better said by experts in this art and in the sciences which justify its precepts. But as a physician I am strongly moved to use this rare opportunity to preach a brief medical sermon. My text is taken from the first chapter and first verse of a late writer on hygiene. "Hygiene aims to make growth more perfect, life more vigorous, decay less rapid, death more remote."

To this rather material statement I would add another. The highest usefulness in life is only possible with the highest standard of health. I no longer wonder that the ancients worshipped *Health*, the fair goddess Hygeia. Be pleased to observe that this was a feminine deity, a goddess of health. The fact is not without meaning. So great is my reverence for supreme wholesomeness that I should almost be tempted to assert that perfect health is virtue. At least as a physician I like to say that, in my opinion, and for men in general, health, the best health, is essential to the attainment of that efficiency which makes duties easy and resistance to temptation a normal result.

Speaking of the higher, the spiritual development of man's faculties, a famous divine has said: "Yes, it is a good thing to be born again, but he who wins this new birth will be better born again for having first been well born." The truth, the largely applicative truth of this epigram comes home to every physician who has seen how much of the usefulness of the good and the productiveness of the intellectual is crippled or lost because of physical failures due to follies in education, or to impairments growing out of preventable maladies.

I have a fixed belief that a population below the normal level of health is sure to be also below the norm of goodness. I am as firm a disbeliever in the utility of long-disordered health to make men better. You remember what Becky Sharp said of goodness: "I should have been a good woman had I had £5,000 a year." Trust me, a large income of health means for the many, capacity to live at their moral best for themselves and for their fellows. Poverty of blood like poverty of pocket has its temptations.

Others to-day will tell you how the ill health that comes to masses of men in epidemics affects the economic prosperity of a community—who

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vast is its influence, how untraceably far reaching. I have chosen rather to hint at the ill results as to morals which may arise from lowered health owing to the poverty it entails, the direct and indirect temptations it creates, the self-indulgence it fosters in a variety of forms. It were easy to point this moral with many a sad tale. The story of every great epidemic—the plague, the cholera, yellow fever—is dark with histories of human baseness. But there are in our vast cities influences more or less capable of remedy which cause no death and put none at once to bed, and which, nevertheless, entail on communities lowered conditions of health, affect the enterprise and spirits of men, and morally and mentally depress so as in subtile ways to cause degradation, desire for alcohol and degenerative changes.

In a few pregnant sentences I have tried to set before you this novel question of the influence of health on morals. I dare not linger on a tempting theme. I started with a text and I find I have given you but a string of texts. May I not trust the sermon to your own intelligence?

To teach the individual the preservative laws of life, to teach the city, the Commonwealth, the country how to avoid and subdue epidemics; how to provide that every water-course be kept sweet and pure, the air of cities uncontaminate, manufactories innocent to health—these are the large lessons which our school house of health is to teach.

Thinking of our new enterprise, and, too, of the individual failures which may come out of an insufficient capital of bodily health, I am suddenly reminded of the holiday which the nation is now keeping. No thoughtful American can face an audience to-day, whatever may be the more remote purpose of his speech, and fail to think of one great historic figure. Let me bring him into relation with our own business of the hour. He represents for me that admirable form of hygienic preparation for a time of strain and trial which came out of a vigorous, manly, out of door struggle with the exigencies and risks of the life of an engineer and frontiersman. Sound alike in mind and body, of clean descent, his consummate physical health must have had much to do with the clearness of head, the constancy of energy and the perfect courage which carried him through the wasting worries, the doubts and the darkness of disastrous days. It would be easy to make for this picture of successful health a sad, contrasted background of historic failures, of national defeats, of perverted genius due to the want of this one thing—health.

A hundred illustrations crowd upon my memory, but without apology I turn from the great presence I summoned for a moment to point the moral of the hour, and leave with you the thought of the value to greatness, aye, to all goodness, of sturdy health.

And now, a brief summary of the history of the birth of this laboratory and school of health.

A few years ago, a grave loss of one very dear to my friend, Henry

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Charles Lea, turned his ever active attention to the progress of science in its later revelations of the cause of consumption. The vast discoveries of Pasteur led up to Koch's convincing proof of the role played by minute organisms in the causation of tubercle. A multitude of like researches followed with confusing swiftness. One disease after another has been traced to its parent cause in some tiny agent of mischief. A row of culture-tubes in a laboratory, with their bright colored organisms, represents a Pandora's box of pathological disaster. But a little while ago the strong advance of medicine seemed to be stopped by a wall. Then of a sudden wide gateways opened, and behold, this magnificent outlook—this broad road with its numberless byways—and so again we go forward with intellectually invigorated hope.

Apprehending the value of the many ways thus open to beneficent knowledge, Mr. Lea proposed to us to create a school of hygiene, in which not only should we teach the art to live, but where also the new and effective helpmate of hygiene—bacteriology—should be provided with means of developmental research. It became clear, somewhat later, that we could hope before long to place in directive charge of the whole work the one man best fitted for it in America, Surgeon John S. Billings, of the army. The well-known modesty of my friend forbids me to say too much of him. The varied tasks he has accomplished serve well to show that a man may be master of many arts, if only he be so constructed hygienically as to be permanently endowed with that unending energy which this man has brought to the administration and construction of museums, libraries, hospitals, to the creation of unsurpassed catalogue and dictionary, to the medicine of war, and to the study of hygiene. This half dozen men in one is the director of our new enterprise. The fact that he was to be at its head induced Mr. Lea to increase his gift for a building to $50,000. On hearing of this, the late Henry C. Gibson at once offered $25,000 as a means for equipment.

I pause to render my tribute of thankful praise to the memory of this kindly, gentle and most generous man. He had the art of giving with such courteous simplicity as made those who sought his bounty feel that he was the one obliged. He had, too, at need, the art of saying "No" in such a fashion that you felt sorry for his manifest disappointment. To no other man was this great school so deeply in debt for repetitions of large gifts.

Mr. Lea has declined to be himself the immediate agent in transferring to the trustees the admirable building which is now fully fitted up and ready for active work. Standing here, in this place, I am unwilling to annoy my friend of many years, by too vividly saying what I think of his thoughtful and splendid gifts to the Philadelphia Library and to this University. But I find it impossible to do as he would wish, and pass by without comment the man who has given us a new means of

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usefulness. I prefer to hurt his sense of reserve rather than to sacrifice my own selfish sense of justice.

As the head of the oldest medical publishing firm in the world, Mr. Lea was so fortunate, or rather so able, as to win for himself the leisure out of which has grown a series of historical works without rival in their special line.

Most of you better know how often this quiet and retiring scholar has come out of his mediæval studies to make a sturdy fight in the cause of political reform, and to wage fierce war against municipal misrule. My words would disturb him were he here to-day, but surely, we are not too prone to praise. There is a time for all things, even for honest recognition of a pure, a true, an honorable life, and of the good and manly work of a model American, a gifted scholar, a generous man. And now, he turns to give to this city the only institute of hygiene in America, and with far-seeing thoughtfulness, asks that the engineer, the architect and the physician we train, shall be obliged to profit by its lessons as part of their education. I have asked that he would at least say by proxy a few words, and here is the brief message he has authorized me to deliver:

MY DEAR DR. MITCHELL: It gives me pleasure to respond to your request for a few words on the objects and motives which led to the founding of the new laboratory of hygiene.

Of all the claims of your noble profession on the gratitude of mankind, perhaps the chiefest is due to the zeal of its members in laboring as earnestly for the prevention as for the cure of disease. Scientific hygiene is essentially the creation of physicians who have ever been foremost in discovering and promulgating the facts and principles on which improvement of public health must be based. Great as have been the strides of this science during the past generation, even more is reasonably to be expected of it in the future. It is not visionary to say that we are on the threshold of discoveries which promise, if rightly used, to relieve humanity from some of the distressing evils which have weighed it down in the past. To this most desirable consummation the University of Pennsylvania makes a notable contribution in rendering the study of hygiene compulsory on all who seek its degrees in medicine, architecture and civil engineering, and in organizing a department of hygiene where scientific investigation and instruction can be conducted under the most favorable conditions.

Important as will be the functions of this department in stimulating original research, perhaps even more immediately important to the community will be its educational activity in annually sending forth numbers of thoroughly trained and well-equipped hygienists. Through their agency we may expect that popular errors will be largely dispelled, and popular indifferences to the laws of health will be removed. The mass of human misery directly traceable to these errors and this indif-

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ference can scarce be overestimated. Of this our own city offers a pregnant example. No great centre of population is anywhere more happily situated than Philadelphia with respect to hygienic advantages. It has every requisite for healthful and prolonged life on its soil, climate, facilities for drainage, abundance of pure water within reach, ample space over which to spread without overcrowding. If proper respect were paid to hygienic rules, preventable disease would be virtually unknown among us, and our annual death-rate would not exceed fifteen to the thousand. Yet during the past year the interments amounted to 22,649, which in a population of eleven hundred thousand souls, is over 20½ per thousand. Now this difference of 5½ per 1,000 means about 6,000 deaths per annum from purely preventable causes—6,000 human beings snatched away before their time, and other thousands reduced to want by the loss of those on whom they were dependent. Yet, ghastly as is this aggregate, it is in reality the smallest portion of the evil. Experience shows that every death represents about twenty cases of sickness not immediately fatal, so that 6,000 preventable deaths per annum infer 120,000 cases of preventable sickness. Each case of sickness will average from thirty-five to forty days, so that every year in Philadelphia there are 12,000 years of preventable sickness endured by its inhabitants.

Think what an aggregate of suffering this represents; think of the thousands of families who are annually exposed to privation through the disability incurred by the breadwinner or by the mother; think how many of those who are hovering on the border between comfort and poverty are permanently plunged into pauperism through temporary sickness, and you will agree with me that the department of hygiene, if rightly administered and efficiently supported by the public, will be not merely a valuable scientific adjunct to the University, but will be the most practical and the most useful institution of public beneficence that the community can have, for it will deal in the largest way with the causes of these vast evils. If it is blessed to relieve human miseries, it is still more blessed to prevent them.

Faithfully yours,

HENRY CHARLES LEA.

What more can I add to this clear and touching appeal? Ah! but there must be some among you who will read between its lines their own memories of glad young lives sacrificed to diseases which should hardly exist, or of the days of doubt and heartfelt anguish, which ended more happily, but can never, never be forgotten. There can be few of us in this typhoid-smitten city who have not walked of late in the shadows of this needless calamity. Try to believe with me that, in a rightly organized municipal life, these evils may be greatly lessened. They are not necessities of God's making. Try, ah! try with us to think that much of pain and disease is but the stern consequence of some sin

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of omission or commission, or of the indifference and unintelligence of an inert community.

Mr. Lea's gift was conditioned on the raising of $200,000 as an endowment. The trustees were themselves so assured of the need for this department that they gave in individual gifts not less than $35,000. The professors contributed $12,000, and the Provost was enabled to secure for it the endowment of the Pepper Professorship of Hygiene, amounting to $57,000. Altogether the endowment reaches $213,000, inclusive of Mr. Gibson's gift.

If now you will in turn permit me to read between the lines of Mr. Lea's letter, and be eloquent where he is mute, this would be his brief addition:

The city and the community owe to my belief in their needs this school of health. A generous hand equipped it. To make it thoroughly all it should be—to buy for its use those precious instruments, competent chemists and bacteriologists—it lacks at least $75,000 of further endowment. Such words as these the giver of this laboratory might have used to the many in this city who doubtless are ready to match his generosity.

When we have trained within these walls our missionaries of health, we shall send them forth in our university extension work to tell the people that sweet air and pure water should have a say in the ballot-box, and that whether democrat or republican divide the spoils of petty city office is a matter contemptibly indifferent as compared to insuring for masses of men immunity from disease, pure air, space, playgrounds for man and boy, books, baths, music. For honest health, men, aye, and their offspring, need more than security of steady employment. Work without chance of play of brain and limb makes Jack a dull boy, and a dull boy is nearer to possibilities of disease than a happy boy. Believe me, this large-minded view of the hygienic needs of a people is essential to the fostering of the best physical, mental and moral qualities of a great nation.

I beg leave, Mr. Provost and trustees, in the name of Henry Charles Lea, to transfer to your keeping the admirable building he has erected.

And you, sir, director of the activities of our new laboratory, to you we confide with trustful hope the broadly human interests of this enterprise. We believe that, in its practical aspects, the more remotely valuable results of pure science will not be neglected, and that the work of this laboratory will represent that hygienic perfection of science in which constant energy, incessant experiment and observation, and a wise scepticism shall devotedly combine to evolve out of discovery knowledge applicative at last to the nobler uses of mankind.

It is my ardent wish, Mr. Provost, that, through the long years to come, when you and I and all here are gone, the quality of the work still done within those walls may continually justify the bounty of my friend—may help to make the city which is dear to him and to me more wholesome, and may improve and lengthen the lives of men.

18-16-92.

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Address by Benjamin Lee, A. M., M. D.,

Secretary of the State Board of Health of Pennsylvania.

MR. PROVOST, LADIES AND GENTLEMEN: I trust there is no one present on this memorial day and this auspicious occasion whose bosom does not swell with patriotic pride at the thought that he is an American citizen.

Recalling, as we are wont, the virtues of him whom, above all others, we are accustomed to regard as the founder of our liberties, let it be a part of our grateful observance to sum up the blessings which flow from them. And that we may the better appreciate them let us compare the wretched lot of the denizens of cities of the old world, groaning under the iron heel of despotism, with our own more highly favored circumstances. The tyrannical rulers of those down trodden peoples actually presume to interfere with their meats and drinks, forbidding them to quench their thirst with water enriched by the sewage of cities, hallowed by the infusion of the remains of their dead ancestors, or delicately tinted with the drainage of coal mines; or to refresh themselves with beer rendered aromatic and enlivening by cocculus Indicus and strychnine, or wine manufactured from the juicy apple and the generous turnip, or tea composed of rotten leaves and catechu and colored with verdigris, or coffee innocent of Java and Mocha, or chocolate in which the offensive cocoa butter has been entirely replaced with tallow. They are not permitted to eat the flesh of tuberculous cattle and trichinous swine, while we are freely allowed to feast on those which have been condemned for their markets. Even the little children are forbidden the delights of sucking candy brilliant with arsenic, or munching buns beautified with chrome yellow. The very air which they breathe is deprived of the fragrant and nutritious elements which we enjoy in ours by the removal of manure and other putrefactive substances from the streets before they have had time to pulverize or decompose.

If they desire to ride in public conveyances they are compelled to obsequiously sit instead of having the opportunity of athletic exercise and muscular development by hanging on to straps suspended from the roof of the vehicle; or if perchance they prefer their own equipages they have no escape from the dull monotony of smooth and noiseless pavements, so different from our charming variety of cobblestone and car track, of hillock and hollow. Thus these unfortunates are hedged in on every side by onerous ordinances and petty infringements of their liberties. When we add the humiliating fact that those who govern their cities and inflict these burdens upon them are men of their own race and nation instead of alien birth or parentage, what is needed to complete the picture of their misery or to demonstrate the immense superiority of our free institutions? As a result of the admirable training which we receive from the foreigners in authority over us we have

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acquired, to a distinguished degree, the divine virtue of patience, so that an American citizen is recognized at once all over Europe by the lamb-like way in which he submits to physical inconveniences and pecuniary impositions.

But lest this hurried resume of our causes for exultation should make us too vainglorious, I would ask your attention for a moment to a feature of the republican form of government which is perhaps less encouraging.

It has been said in regard to our legislative bodies that as a fountain cannot rise above its source, so we cannot expect in our legislatures a higher degree of intelligence and education than the average of that possessed by all classes of the population whom they represent, by whom they are elevated to office and whom they fear to offend.

It follows from this that legislation of what may be termed the higher order, which recognizes the arts and sciences and aims to lift the people to a higher plane of culture and civilization, and which is founded on the most recent revelations of science, is not to be expected of our municipal and State legislators. And, indeed, so true is this of our own State that a clause exists in the Constitution forbidding the outlay of the public funds for any such purposes. Hence if institutions of learning of a high grade, or devoted to specific objects are to exist among us, they must owe their origin, and to a great extent their support, to the public spirit and generosity of private citizens. Perhaps this is not an unmixed evil; perhaps it is well that in the mad haste to get rich quickly, which characterizes our people, there should be a constantly present condition which evokes brilliant examples of public giving as contrasted with individual grasping. Certainly magnificent instances of such liberality exist all over our broad land, and perhaps nowhere have more frequent benefactions of this kind increased the opportunities of a great institution of learning than have of late years been poured into the lap of the venerable University who has called us together to-day to rejoice with her over the reception of her latest gift and the opening of the newest and loveliest flower in her coronal.

At a regular meeting of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, held November 12 and 13, 1891, a communication was received from the trustees of this University announcing the early opening of its new laboratory of hygiene, and presenting a brief curriculum of its proposed line of instruction, whereupon the following resolution was adopted:

Resolved, That this Board has received with sincere satisfaction the formal announcement of the approaching opening of the Laboratory of Hygiene of the University of Pennsylvania, considering that this event marks an era in the progress, not of science only, but of civilization in this State.

Resolved, That the Secretary be instructed to communicate with Dr William Pepper, Provost of the University, and with Dr. John S. Bil-

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lings, Director of the Laboratory of Hygiene, suggesting a conference for the purpose of formulating a plan by which this Board may avail itself practically of the facilities to be afforded by the laboratory for the investigation of disease and of the means for its prevention, for the analysis of foods, water and other beverages, and for bacteriological studies.

Resolved, That in a definite co-operation between the University and the State Board of Health in the prosecution of such researches, this Board recognizes an opportunity not only for mutual aid but for advantage of the greatest moment to the entire Commonwealth."

In accordance with the above resolution such a conference has been held, and to me has been assigned the duty of briefly stating the conclusions which were reached, promising, however, that they have not, as yet, been submitted to the trustees, and may be to some extent modified before either body is called upon to consider them.

The necessity of a Laboratory of Hygiene to the State Board of Health has been urgently felt, and arises out of the duties imposed upon the latter by section five of the act of Assembly establishing it, which reads as follows:

"The State Board of Health and Vital Statistics shall have the general supervision of the health and lives of the citizens of the Commonwealth, and shall especially study its vital statistics. It shall make sanitary investigations and inquiries respecting the causes of disease, and especially epidemic diseases, including those of domestic animals, the sources of mortality, and the effects of localities, employment, conditions, habits, food, beverage and medicine on the health of the people. It shall also disseminate information upon these and similar subjects among the people. It shall, when required by the Governor or the Legislature, and at such other times as it deems important, institute sanitary inspections of public institutions or places throughout the State."

Now, to carry out in any adequate degree the purposes of the law with regard to investigating the causes of disease, and the effects of foods, beverages and medicines on the health of people, two things, among others, are absolutely essential: first, that the Board should have means and opportunities for making or procuring chemical analyses; and, secondly, that it should have means and opportunities for prosecuting what are now known as bacteriological examinations—the study of the germs of disease. And it goes without saying that where the interests of the health and lives of five million people are concerned, these means and opportunities should be on generous scale, and should conform to the most recent developments of scientific hygienic research, both in this country and in Europe. It does not at all meet the intention and requirements of the statute, that the Secretary of the Board should spend a few cents on test-tubes and chemicals, or press his old Dolland micro-

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scope, handed down from a previous generation, into the service of the State. Nor is it fitting that this great Commonwealth, with its millions of revenue, should be depending, as it has done—I say it with burning cheeks—on the charity of private chemists, who have, in a spirit of generous patriotism, placed their services at the disposal of the Board in order to enable it, in some slight degree, to meet the claims that are constantly and properly made upon it for the analyses of suspected waters and foods. It is hoped, therefore, that the trustees will see their way clear to allowing the Board to refer applications of this kind to the Laboratory for investigation. The Board, for its part, will make every effort to obtain from the Legislature a reasonable appropriation for such purposes, distinct from its general appropriation, which will enable it to meet, at least, the cost of all work done for the State.

Further, section 9, of the act creating the Board, instructs it, "from time to time, to engage suitable persons to render sanitary service, or to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto." Observe the phrases: "suitable persons," "expert skill." Heretofore the Board has been compelled to call to its aid for these objects simply medical men, intelligent, educated, sound practitioners, but without that special training and equipment which would render them "suitable persons" in any strict, technical construction of the expression, or would furnish them with "expert skill." Here, again, the Laboratory will prove the right hand of the Board, giving just that instruction which a sanitary inspector needs to fit him for his special work. And, on its side, it will be the object of the Board to pursue more persistently, even than it has in the past, its purpose of obtaining a thorough sanitary organization of the State under legislative sanction and compulsion, the result of which will be to create a constantly increasing demand for just such trained, practical sanitarians as this school will graduate. In this view of the case it might be the part of wisdom for you, gentlemen, trustees, to place a certain number of scholarships at the disposal of the Board.

Finally, it is desirable that publicity should be given to the important work which will be carried on in this institute, which, I risk nothing in saying, after a careful inspection, and after comparison with other similar Laboratories, will be far in advance of any in this country and the peer of any abroad—it is highly desirable, I say, that this work should be frequently brought to the notice of the Legislature, the medical profession and the public, and I therefore suggest that its director present a stated report, quarterly or at such other interval as may be deemed expedient, to the State Board of Health, of all investigations here prosecuted directly in the interest of the public health, which report shall form a portion of the Annual Report of the Board, to be transmitted to the Governor, and of which a certain number of reprints shall be fur

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nished to the trustees for general distribution as well as for preservation in the archives and various libraries of the University.

The edifice, whose inauguration has drawn our willing feet hitherward, ladies and gentlemen, is a temple of Hygeia in a truer sense than those fair structures whose marbles flashed back the morning light on the hill, of Greece and Rome.

It is in honor of the "sweet, smiling Goddess of Health" that we are met.

The ancients were right in making the divinity whose especial cars was the bestowment and maintenance of health, a feminine conception, since woman, as the wife, the mother, the nurse, has for her special function that daily ministry to the bodily welfare of husband and of offspring, that constant presence in and care of the home which are the two essentials to health in the individual and in the family.

Her embodiment must needs have been youthful, as presenting ever to the mind of the entranced beholder that period of life when a blood unvitiated by vice or excess courses through a frame unmarred by violence or exposure, and colors a cheek unstained by sin. Purity must look forth from her eyes and truth sit enthroned on her brow, for unbridled passion and soul-torturing deceit are alike inimicable to perfect health. Her form must be lithe, vigorous and well-nourished, but not redundant, as warning her devotees that neither asceticism on the one hand, nor gluttony and voluptuousness on the other, are allowable in her worship. Cheerfulness must radiate from her every feature, for gloom and despondency are the recognized foes of sanity, whether of body or mind, and over all pervading expression of face and pose of limb must be that indescribable charm of gentleness, as teaching her votaries that in the mutual interchange of kindly sentiment and act, they shall greatly promote the common health and the common weal. And so has the charming inspiration come down to us, immortalized by the sculptor's art, a frank and joyous maiden, full of tender grace, robed in chaste and flowing vestment. The fabled daughter of Æsculapius, her temple ever nestled under the shadow of his loftier fane, as does that which we dedicate to-day, and her lovely image was sometimes seen in the same shrine even side by side with his severer figure.

May I be pardoned for appropriating to her praise the beautiful sonnet of America's most American poet, although addressed by him to a sister divinity, whom also we glorify on this national anniversary—

Who cometh over the hills,
  Her garments with morning sweet,
The dance of a thousand rills
  Making music before her feet?
Her presence freshens the air,
  Sunshine steals light from her face,
The leaden footstep of care
  Leap to the tune of her pace.
Fairness of all that is fair,
  Grace at the heart of all grace!
Sweetener of hut and of hall,
  Bringer of life out of naught,
Hygeia, oh, fairest of all
  The daughters of Time and Thought.

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Address by Dr. John S. Billings,

Director of the Institute of Hygiene.

The following is an abstract of the address of Dr. John S. Billings, from advance proof-sheets furnished through editorial courtesy of the *Medical News*, published by Messrs. Lea Brothers & Co., of which firm Mr H. C. Lea, the founder of the Institute, is a member.

The chief object of the existence of the Institute of Hygiene is to fit a certain number of men from all parts of the country to investigate and solve the problem connected with the securing of the best health and vigor among our people.

We hope, also, that some increase of knowledge will be made here by the workers in the laboratory itself; but the main point to be kept in view is to provide well-trained, scientific and practical men for other fields of labor. Dr. Mitchell has said that the true rate of advance in medicine is not to be tested by the work of single men, but by what the country doctor is. So, also—and even more so—advance in practical sanitation is not to be measured by laboratory records, but by what health officers and sanitary engineers are able to accomplish.

Even now we *know* much more than we *do*, and the skilled sanitarian too often finds himself in the position of the unhappy daughter of Priam and Hecuba, who could foretell but to no purpose.

This laboratory is fortunate in being closely connected with, and in the immediate vicinity of, a great medical school and of great hospitals. As was said before, one of the essential foundations of scientific knowledge of the causes of disease is minute and accurate diagnosis and pathology, and we are, therefore, in constant need of the best knowledge of leaders in these branches of medical science. The hospital is filled with specimens of the results of such causes, acting on the human body—from one point of view, nature's experiments with poisons cunningly elaborated in the tissues of the body, or with viruses coming from without, upon blood and bone, muscle and brain. Much of the work of this new department will be connected with the results of these experiments.

The laboratory is also fortunate in being located in a great manufacturing city, where the effects of different occupations, of trades, dangerous or offensive by reason of dusts, or of vapors, or of waste products, can be readily observed, and the materials for study obtained. There is an immense field for a sanitary clinic here, and in the habitations, the streets, the water supply and the sewers of Philadelphia.

Practical hygiene is to play an important part in municipal government, to secure the best form of which is now one of the most urgent questions of the day. Many of the questions to be decided by city officials as to water supplies, sewage disposal, etc., require expert knowledge to answer.

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Bacteriology, chemistry, pathology, physics and medical and vital statistics give us the foundations, but sociology and jurisprudence must also be studied in their relations to sanitation to obtain the best results.

Labor questions, education questions, maritime and interstate commerce questions, and methods of municipal finance and government are all intimately connected with matters of personal and public hygiene; and economic consequences, as well as health, must be considered in the advice and regulations of the sanitarian.

I count it as fortunate, therefore, that there is a Law School and a School of Finance and Political Economy in this University, to which the department of hygiene can look for advice and friendly criticism when these are needed, as they surely will be.

And now a very few words as to the needs of the laboratory. First of all it needs men—men thirsting for knowledge, and fitted, by previous training and education, to come here and acquire that knowledge, not merely the knowledge that exists in books, or that the teachers in this laboratory may possess, but that which is yet unknown, the weight of that which no one has yet put in the balance—the shape, and size and powers for good or evil of things whose existence has not yet been demonstrated.

There are not many such young men whose tastes will be in the direction of these lines of research, and of these there will be very few who will have the means to support themselves while engaged in the work. We need, therefore, the means to help them in the shape of half-a-dozen fellowships, paying about five hundred dollars a year each, and granted only to those who give satisfactory evidence of capacity and zeal.

The second thing we want is a demand on the part of the public for really skilled, well-trained sanitary investigators and officials, such as we hope to send out from here; we want a market for our product; we want the legislators of this and other States and of our rapidly-growing municipalities to be educated to appreciate the importance and practical value of such health officials, and to give the best of them employment.

Thirdly, the Laboratory wants the co-operation and assistance of sanitary authorities and inspectors, and especially of those of this city and State.

It needs to know, from to time, what they are interested in and are working at, to have the opportunity of showing to its students cases of special interest—sick houses, localized epidemics, special forms of nuisance.

And, on the same principle and for the same reasons, it desires to have its attention called to special methods of heating, ventilating and draining buildings, such as schools, hospitals, prisons, churches and theatres, and to matters connected with the hygiene of manufacturing establishments and special occupations, methods of disposal of offen-

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sive or dangerous waste products, of protecting workmen against dusts, gases, etc.

In short, we want to know how these things are managed by the men who have a practical interest in them; and if, in our turn, we can suggest improvements, we shall be glad to do so.

Fourth, the Laboratory wants a reference library as complete as it can be made, and always up to date. Many of the books and journals required must be purchased, and for this purpose a special fund is needed, but many of the works required can only be obtained by gift.

Thus, we want all the reports of boards of health—State and municipal—of municipal engineers, water-works and water commissioners, park commissioners, etc.

We want the catalogues and circulars of all manufacturers of heating and ventilating apparatus, of plumbers' supplies and house fixtures, of electric and gas fixtures, of machinery and apparatus connected with water-supply and sewage-disposal.

We want copies of plans and specifications of large buildings of all kinds. And these things can only be obtained through the aid and good-will of manufacturers, engineers, architects and sanitarians all over the country; and this aid I venture to ask, feeling sure it will be granted by those who know what is wanted.

I will mention but one more special want to-day, and that is of means for the proper publication of illustrated reports and accounts of the work done in the Laboratory. In the meantime we must be patient, and not too eager to touch the fruit of the blossom that is not yet blown.

Address by Dr. H. P. Walcott,

President of the State Board of Health of Massachusetts.

The following is an abstract of the address of Dr. Walcott:

Our commonwealths, however widely separated, have substantially the same interests in measures for preserving the public health. I will therefore speak of the experience of my own State in these matters. The sanitary laws of any community are almost invariably the most arbitrary with which public authorities are charged. Hence it is one of the strongest tributes to the conservative influence of scientific training and of the intelligent practice of medicine that we can truthfully claim that very few of our sanitary laws have used their great powers harmfully.

The Legislature of Massachusetts determined to do several things: in the first place to find out how seriously the sources of water supply to its cities were polluted, and to ascertain what remedy could be applied. These investigations we placed in the hands of the State Board of Health. It was soon found that waters from different regions of the

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State could not be judged by the same standard. It was ascertained however, that waters collected from certain districts, when taken from unpolluted streams, did offer, in one chemical constituent, a very marked resemblance to each other; and if the various districts were arranged in a certain way, the variations of this substance were so constant as to permit of use in deciding from what portion of the State our unpolluted water came.

This substance is common salt. As it is at the same time the invariable evidence of the presence of the products of human life, its significance as a sanitary standard of purity is very great. Upon a map of the State the places at which were found the same quantities of chlorine in waters obviously free from pollution were connected by lines. For convenience, such lines were called isochlors. These isochlors representing successive differences of .05 part, of chlorine in 1,000,000 parts of water, while near together and generally parallel in the eastern part of the State correspond roughly to the coast line. Farther back from the ocean they are more widely separate, and are not so noticeably parallel. The use that is made of the chart is this: when the chlorine in a given water agrees in amount with the normal chlorine of the district, the water is assumed to be unpolluted. Excess of chlorine when found is taken as evidence of contamination. The excess of chlorine stands in a very direct relation to the number of inhabitants on the watershed. The Board have determined that four families of twenty persons per square mile will add on an average .01 of a part of chlorine per 100,000 of the water flowing from the area.

It has for a long time been known that sewage could be satisfactorily purified by applying it in the way of broad irrigation to land occupied by growing crops. When it was determined that the destruction of nitrogenous matters was not the results of oxidation by the action of the air contained in the soil, but that the presence of micro-organisms was essential to the process of nitrification, these experiments were made which showed astonishing results in the quantities of sewage that could be purified by filtration. Nitrification was shown to be due to the action of certain micro-organisms by Schloesing and Muntz in 1877. In 1890, the Franklands and Warrington in England, Winogradsky in Zurich, and Mrs. Richards and Mr. Jordan at Lawrence, Mass., announced the discovery of a microscopical organism capable of nitrifying but not growing in gelatine plate culture. Observations made on the filters at the Lawrence Stations have taught us that rapid nitrification is always coincident with a marked diminution in the number of recognizable bacteria.

DESCRIPTION OF THE INSTITUTE OF HYGIENE.

The laboratories of von Pettenkoffer in Munich, Rubner in Berlin, the Imperial Health Bureau in the same city, the laboratories of Fülge at

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Breslau, and Frankel at Marburg, that of von Esmarch at the University of Königsberg, Lehmann at Wurzberg, the famous Pasteur Institute in France, and the Laboratory of the Royal College of Physicians in England, have all been examined in modelling the new Institute of Hygiene of the University of Pennsylvania. It has been endeavored to combine all the best points of the European schools, adapting them at the same time to American conditions, both in the construction of the building and the formation of courses of study. The results of the personal experience of both Dr. John S. Billings, and his assistant, Dr. A. C. Abbott, in the laboratories abroad, are apparent everywhere. The building is plainly but substantially built of brick and brown sandstone, the dimensions being 113 feet by 91. The building is in itself a perfect object-lesson. Beauty in finish in the construction has been omitted wherever a practical service could be benefitted. For example, the pipes throughout the building have been brought several inches outside the wall, and each being painted a distinctive color—a maroon pipe, wherever found, being a steam-pipe; red invariably denoting hot water; blue shows cold water; white means gas, and yellow stands for drainage. In this way each system can be readily traced in all its ramifications, and tested at any point from the boiler to the steam-coil, or from the sewer connection to the roof. Practical sanitary plumbing can be carefully studied in the construction of the building. Moreover, every sort of drainage-device, etc., will be placed in position here as soon as it is placed upon the market and given a fair trial on its merits for efficiency and economy.

In the departments of lighting, heating and ventilating, the same broad principle has been applied. In the large laboratory, on the first floor, there are now seven different kinds of steam radiators. They can all be used at once in cold weather, or each may be used and tested separately, or any one may be removed and another put in its place.

The course in hygiene, which will occupy eight weeks, is divided into twelve parts. Its scope will be practical to the last degree. The study of water comes first. Water-supplies in general will be treated physically, chemically and bacteriologically. Students will be taught how to obtain samples and how to analyze them for impurities. Water for drinking and other domestic purposes will receive special attention, the effects of storage, possible sources of pollution, and the various methods of filtration and æration being considered. The disposal of garbage and other refuse, and the still broader question of drainage and sewage-disposal, will be studied. The study of building sites and soils, and the bacteria resulting from decomposition in the ground, will be included. Ventilation, including the study of climatic and meterological conditions, will be thoroughly gone over. The school will investigate the adulterations of food and their detection, and will also take up milk and its inspection, a line in which the university veterinary school has already obtained some prominence.

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The next part of the course includes the study of poisonous dyes in clothing and their methods of detection, followed by the investigation of illuminants, electricity, gas and oil, with the hygienic effects of each. In the management of contagious diseases, methods of disinfection, notification, isolation and quarantine will be treated both in the laboratories and by lectures. The lectures will include instruction on the subject of vital statistics, registration, etc., and the study of trades dangerous to the individual or offensive to the general public.

Lectures in sanitary jurisprudence, the law of nuisances, and an outline of the duties of the health officers appropriately close the course in hygiene. For those who take it throughout, a fee of twenty-five dollars will be charged. Special research in any of the lines will be encouraged, and ample provision made for it in the five smaller laboratories on the first floor.

Closely allied with the course in hygiene is that of bacteriology, which also has twelve parts and will occupy the main laboratory on the second floor. The apparatus is naturally somewhat different from that of the ordinary chemical laboratory, and students have to be especially instructed in its use. The course consists in the preparation of bacteria mixtures, or cultures, the detection and separation of different species, etc. Diseases produced by bacteria will receive the closest attention, the microscope being, of course, a prime factor in their identification. The effect of various disinfection methods, both chemical and thermal, will be efficiently tested. Many of the most delicate experiments are to be performed in a separate glass-room, thus providing an unvarying temperature and securing an almost total exclusion of dust.

Prominent among the special features of the building are the drawing and photographic rooms. The former will be used by those in the university's architectural courses and other students in architecture, who will find here instruction of the highest importance to them in their profession. The photographic section contains three rooms: a large gallery with partially glass roof, for making enlargements of plans, a convenient dark room, and another which serves a curious purpose, a heliostat to throw a single ray of light into the room, which, being otherwise perfectly dark, is thus converted into a huge camera obscura, with space for a dozen men to work inside of it. The library of the school is worth noting, as it will contain, beside text-books, all the hygienic periodicals, most of which, by the way, are from Germany.

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3. PROCEEDINGS OF THE SIXTH STATE SANITARY CONVENTION.

ERIE, *March 29, 30 and 31, 1892.*

The Convention met at Mennerchor Hall at 10.30 a. m., and was called to order by the Hon. J. F. Downing, of Erie, who had been requested to act as president.

Prayer was offered by Rev. J. C. Wilson.

On motion of Dr. Benjamin Lee, Prof. Wm. B. Atkinson, M. D., of Philadelphia, was elected secretary.

An address of welcome was delivered by Hon. J. F. Downing, in the absence of the mayor of Erie who was detained by illness.

Dr. A. A. Woods, health officer of Erie, read a paper on diphtheria as it prevailed in Erie during January, February and March, 1892, and November and December, 1891.

The report was discussed by Drs. G. G. Groff and Benjamin Lee.

At the afternoon session, Dr. Barr, of Titusville, was called to the chair.

Crosby Gray, Chief Clerk Department of Public Safety, Pittsburg, read a paper "Notes on Sanitary Condition and Necessities of Pittsburg."

Dr. E. Cranch, of Erie, read a paper on "Prophylaxis and Quarantine of Scarlet fever."

Discussed by Drs. Whitcomb, Woods, Bradley, Lee, Atkinson, Groff, Motter and Davis.

Dr. George G. Groff, of Lewisburg, read a paper on "Emergency Hospitals."

Discussed by Drs. Varian, Motter and others.

Colonel W. F. Morse of New York, read a paper on "Methods of Collection and Disposal of Waste and Garbage."

At the evening session, Dr. Murray Galt Motter, of Lancaster, read a paper on "Trichinosis."

Dr. S. T. Davis of Lancaster, read a paper on "Faith Cure Epidemic."

On Wednesday, March 30, the Convention re-assembled at the Tabernacle Church, Prof. S. R Thompson, of Westminster College, presiding.

Dr. G. G. Groff, of Lewisburg, read a paper on the "Hygienic Care of Dairy Farms and Dairies."

A paper in discussion by Dr. J. C. Morris, of Philadelphia, was read by the Secretary.

Dr. L. H. Taylor, of Wilkes-Barre, read a paper on "Typhoid Fever Caused by Impure Milk Supply."

Dr. J. H. Montgomery, of Erie, read a paper "Compulsory Domiciliary Quarantine against Diphtheria."

At the afternoon session; Dr. B. E. Mossman, of Greenville, read a paper on the "Enforcement of Sanitary Laws."

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Dr. D. N. Dennis, of Erie, read a paper on "Microscopic Examination of Water from Public Water Supply of Erie."

Dr. G. G. Groff read a paper on "Earth Closets."

The Secretary read a paper by J. M. Simonin, C. E. of Philadelphia, on "The Sanitary Utilization of Garbage and Refuse, and Destruction of Germ Life in Infected Material without Injury to the Article Treated."

George E. Platt, City Engineer of Erie, read a paper on the "Sewer System of Erie and the Indispensable Improvements Needed Therein."

S. S. Jones, Editor Carbondale *Leader* and secretary board of health of Carbondale, read a paper entitled "Difficulties to Overcome."

Dr. Wm. B. Atkinson, of Philadelphia, read a paper "Diagnosis of Typhus Fever and the Steps Taken by the State Board to Prevent its Introduction or Spread in the State."

Dr. D. B. D. Beaver, of Reading, read a paper on "Is Typhoid Fever a Rural Disease?"

In the evening the Convention listened to the annual address, "The Economic Value of Sanitation," by Peter H. Bryce, M. D., of Toronto, Member of the Provincial Board of Health of Ontario.

The Members of the Board, the Medical Inspectors and guests were entertained at a banquet on Wednesday evening by the authorities of Erie.

The Economic Value of Sanitation.

By P. H. BRYCE, M. A., M. D.,

Secretary of Provincial Board of Health of Ontario, Toronto.

GENTLEMEN: To an audience such as this it will not be necessary for me to define at any length the word sanitation; but I may say, in brief, that I shall take it as meaning the act of keeping or making whole, sound or healthy, whether it be applied to the individual, the municipality, or the nation. But, indeed, as nations are merely divisions of a larger whole, I shall say, or of the people of the world; since we shall see that this work of sanitation has a truly continental, and even intercontinental meaning; and that the watchword the sanitarian may most properly adopt are the words of an American poet:

> "No pent-up Utica confines our powers,
> But a whole, vast continent is ours."

If, then, our definition be accepted, it ought not be difficult for every one in my audience to agree with me, that keeping healthy has a value —and, indeed, an economic value—of a very definite character.

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Assuming, then, that my audience agrees with the premises, I trust I shall not find it difficult to carry them with me in the conclusions which I shall endeavor to draw therefrom.

The definition I have given of sanitation at once makes it evident that into whatsoever spheres man's life and activities enter, whether of being or doing, the degree or quality of his soundness or wellness must have an economic value, capable of being accurately measured or weighed in proportion as we have the exact length of the measuring-yard or the balances sufficiently well adjusted.

I propose, therefore, briefly to show where, in a few instances, economic losses and gains have occurred; and shall thereafter endeavor to indicate how sanitarians have in the past added and are still endeavoring to add to the credit side of the ledger.

In the Centennial Discourse of the late lamented Dr. Henry I. Bowditch, of Boston, on Preventive Medicine, he refers to the First Epoch of Medicine in America—ending in 1832—as the so-called "Drug Epoch," wherein drugs were everything and Nature was forgotten.

From this period to 1868, when the First State Board of Health was established, he calls the Second Epoch, wherein has been seen the growth of a skepticism as to the value of drugs, and a profound reverence for Nature and a strong belief in her powers of limiting and curing disease.

Nowhere has the popular side of this belief been more neatly expressed than by the Honorable Thomas F. Bayard, late Secretary of State, in an address to the International Medical Congress, at Washington, in 1887, when he said, "Forgive me if, as one of the great army of patients, I humbly petition the profession that in your deliberations Nature may be allowed a hearing when remedies are proposed; that her *vis medicatrix* may not be omitted in computing the forces of cure, and that science may be restricted as often as possible to sounding the alarm for Nature to hasten, as she surely will, if permitted, to the defense of the point assailed."

In this period, although much more brief, positive legislative results were forthcoming, and in it may be set down, as in England, the inauguration of an epoch which Bowditch has called "that of observation," or "the accurate recording of facts, and subsequent analysis of them."

To this period we look back, as sanitarians, with reverence, as being that wherein modern sanitation was born. As early as 1828 the late Sir Edwin Chadwick had published an article in the *Westminster Review* on "Life Assurance."

He commenced, without any strong bias, an inquiry as to whether the surroundings or environments of individuals have an influence on their health and duration of life. His conclusions, which were opposed to those stated by the Government Actuary to a Parliamentary Committee, were that the expectancy of life in the middle classes of England, with improved social and moral conditions, had distinctly improved. And,

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as he has stated, from the train of reasoning thus developed grew what he called "The Sanitary Idea." Other articles followed on "Preventive Police" and "Public Charities."

After slumming in the east end of London, where he contracted typhus fever and all but succumbed to it, in 1832 he was appointed Secretary of a Royal Commission of Inquiry into the Poor Law System.

In 1838 a severe outbreak of fever in East London caused an inquiry to be held into its cause, and thus "the first sanitary commission was appointed, and its reports caused quite a sensation and a demand therefor, till 9,000 copies were distributed."

But another outcome of Chadwick's early labors was the institution, in 1838, of the registration of births, marriages and deaths in England--to the position of registrar of which the distinguished Dr. Farr was appointed.

I need not, gentlemen, further outline the rise of sanitation. Given the two elements of observation and registration, we have the factors necessary to the study of the economics of the science.

Said the late Dr. Parkes: "The attention now paid to the public health is in a large degree owing to the careful collection of births and deaths, and of the causes of death in England during the last fifty years."

We see, then, that in this so-called epoch of observation were supplied, notably in England, the elements necessary to the determination of the principal factors which enable us to draw fair conclusions regarding the value of sanitation to the State.

THE VALUE OF LIFE.

Reference has already been made to some studies carried on at the beginning of the "sanitary period" on the commercial value of life. This must be our starting point. All must agree that the individual life has a certain value to the State, simply from its power to produce wealth. The first estimations regarding the value of life were intended to enable the government of England to fix the annual amount which ought to be paid as an annuity on a certain amount paid over to it; and that insurance companies might equitably estimate the amount of premium to be paid on a policy issued for a given amount. The result of extended inquiry into the lives of government annuitants was that, during the century preceding 1830, the length of life had notably increased and especially in the years succeeding the Napoleonic wars.

Baron Delessert showed that in France in the

14th	century	1	person	died	in every	17
17th	"	1	"	"	" "	25
18th	"	1	"	"	" "	30
1820–25		1	"	"	" "	39

The importance of this fact became at once manifest. It was seen that if a life was prolonged by twenty-five per cent., then the govern-

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ment would by that amount be paying too much for an annuity. On the other hand, insurance companies were becoming enormously rich by basing rates on the supposition of the duration of life being, say twenty-five per cent. shorter than it actually was.

We thus can see that a life must be considered as having an actual cash value to the State, whether viewed from its power to produce wealth, or by the capital which, made by the annuitant, is actually loaned to the State, for investment in some presumably profitable manner.

Manifestly, therefore, the saving of the lives of the population of a State is one of the most positive methods for the production of wealth, much better by far than the introduction of new populations by immigration, who apart from their possibly lower physical, moral and mental status and foreign tongue, must be, for some years at the best, of small value, not being trained to the special customs and class of work of a new country.

Let me now present a few illustrations of how wealth in this sense has increased in England:

In 1650	England	had a	population	of		5,500,000
" 1801	"	"	"	"	"	8,892,586
" 1878	"	"	"	"	"	25,000,000

and during this latter period she has also contributed many millions to the population of the United States. We have already seen that the duration of life was increasing, the registrar general's returns showing that

In 1849 in England, a cholera year, the death rate was 25.1 per 1,000.
1866 " " " " " " " " " 23.0 " "

From 1876 onward there has been an almost uninterrupted fall. In 1871–80 its mean was 21.27. In 1889 it was only 17.8.

Says Dr. Farr, of the period between 1871–80, the reduced rate meant an annual saving of 20,000 lives; or, comparing the period of 1838 to 1854 with that of 1871–80, the rate in the latter added nearly two years to the life of every boy, as compared with that in the former; or 39.91 years increased to 41.35. Or, to put it another way, taking the annual births between 1871–80 at 858,878, the difference between the two rates shows a gain for the whole children at the latter rate as compared with the former of 1,800,047 years.

What this saving of life means, is that every year of the latter period saved to England 20,000 people, or 200,000 in all, having a length of life of forty years—thereby giving to the State all the wealth which each may produce during forty years.

Quality of the Value of Life.—It must, from what has been said, appear evident to every one, that whatever has improved the conditions whereby life is prolonged, has served the economic purpose of increasing the population of a country. But some might object that it does

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not follow that wealth has increased simply because population has, remembering that $50 of pure silver dollars would equal $100 in silver if 50 per cent. was base alloy.

I shall endeavor, however, to show further, that the quality of the value of life is actually proportionately increased by sanitation.

This is seen in several ways; thus

(*a*) Assuming, as is the case, that about one in every fifteen of the English population is an artisan, and that he has two years added to his life, then as skill increases with experience we may say the producing value of 2,000,000 and more of English artisans for two years is added to the wealth of the country.

(*b*) By the relatively higher continued healthfulness of the man, who is to live two years longer than under other conditions. This is a fact beyond dispute. It has not infrequently been stated in a superficial way that by reducing the mortality we maintain alive a population of weaklings. But the statement is most misleading. If it be true that if by purifying the air of a city or a single workshop, wherein are 100,000 people or 100 employes, we are able to keep the infants and children from dying at the rate of one to four in the first year, or fifty per cent. of all under five years of life, it is equally true that in the other we have enabled, say, 100 work-girls to maintain a higher average of health, and while the weak might in a vitiated air have become unfitted for work, the strong would proportionately have had their average health reduced. Or, to put the matter in another way, suppose 10, 9, 8, 7, 6, 5 be taken as degrees of resistance to disease, and that all below 5 are doomed to die before reaching 21 years, then it is plain that any influence by which the resistance to disease is lessened does by so much tend to depress the first five proportionately, the rest below the line which to the onlooker is called the health line. Indeed, as has been well said, "The whole object of sanitary legislation is to so increase the resistive power as to incase the body in that which shall be proof against an attack." This is on the positive side; but on the negative it may be said yet more truly "that the object is to remove those influences or conditions which may be called the attacking forces."

Sir Spencer Wells, before the Sanitary Institute of Great Britain, as president in 1886, said: "Assuming that in fifty years 200,000 of a population had been saved by sanitation and medical work, then their economical value was at least £300,000,000, and that a clear gain." Formerly it was calculated that one in twenty-three of the population was constantly sick and the products of all their labor necessarily withdrawn. A great deal of this sickness has been altogether prevented, and the duration of that which comes in spite of sanitation is lessened.

But having set forth the economic value of sanitation so far as it saves lives to the State, I shall now illustrate its bearing upon the prosperity of some of our lakeside cities before adverting to some of the more modern of our sanitary or life saving appliances.

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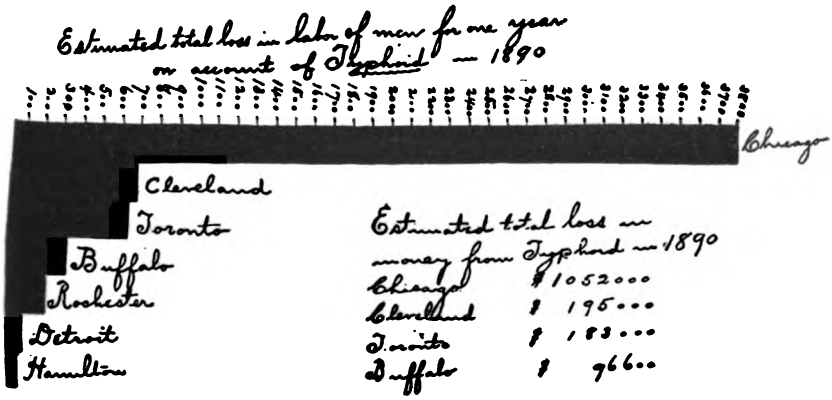
To this end I have had prepared three diagrams, which show what the death rate was in the several cities during the year 1890 for the two contagious diseases which cause the major proportion of deaths—typhoid and diphtheria. As will be seen from their relative prevalence in different cities, they stand in two very distinct categories as regards causation. While both are filth diseases, and hence are both capable of being propagated in town filth and sewage, yet diphtheria does not seem capable of causing extended epidemics through polluted water supplies, while on the other hand typhoid is now known to cause town epidemics principally through this medium. They also have two other distinctive differences, viz: First, that typhoid attacks especially persons of fifteen and over, while diphtheria is comparatively infrequent among adolescents and adults; and second, that while typhoid is but slightly disseminated by direct contact, with ordinary care, diphtheria is intensely infectious to the young, who are peculiarly susceptible to it.

The diagrams referred to illustrate this in a remarkable manner. Take Chicago and Detroit for instance. In Chicago the death rate from



both is high, while in Detroit typhoid is remarkably low and diphtheria is enormously high; the disproportion here seen to be so great exists to some extent in the other cities, while the special conditions to which I shall allude exist to a greater or less extent.

By reference to the diagram for typhoid it will be seen that it is high in Chicago, Cleveland and Toronto. All of these cities get their water supply from the great lakes, as do the others, but mark the difference. In each of these the city's sewage is poured into the bay or lake in front of the city, whereas Detroit, Buffalo and Brockville pour their sewage into the great rivers flowing past them at the rate of several miles an hour, making the least contamination of their drinking water impossible. In the case of Hamilton, while the sewage is poured into the bay it is wholly land-locked, and the water is pumped from the lake outside the bar. Curiously enough Windsor, a town of 10,000 in-

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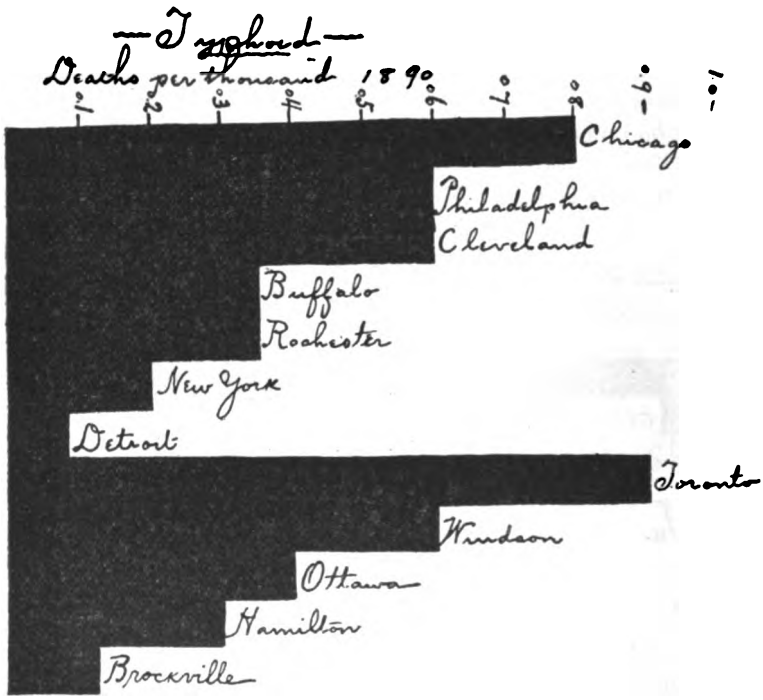
habitants, has a death rate from typhoid approaching the average of Chicago and Toronto, though it is opposite Detroit, but the difference is due to the fact that Walkerville sewage passes into the river a few hundred yards above the Windsor intake pipe.

What is here stated will, I believe, prove to be a law of pollution, viz: That taking a series of years the pollution of even relatively immense bodies of lake water which, having no regular flow, are liable to carry sewage to a water intake will, at certain seasons and with winds moving sewage toward the point of supply, cause outbreaks of typhoid



more or less epidemic. * I further believe that we can establish from these diagrams another law, viz: "That in cities obtaining practically all their drinking water from a public supply whose source is beyond the possibility of contamination, typhoid fever will practically disappear from the list of causes of mortality."

As regards diphtheria, from what I have said it will be gathered that I take it to be a fact that its prevalence depends directly in towns where public water is in general use upon direct contagion—in other words,

* Thus a weekly analysis of Chicago water showed that with a southwest wind, continuing for a week, the albuminoid ammonia of the water rose from .065, gradually but constantly to .120 per million parts. This wind moves sewage from the sewer outfalls toward the water intake pipe.

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in those towns where municipal regulations are defective either in scope or in their enforcement, or in both. It thus becomes apparent that sanitation in the matter of these two diseases possesses two largely distinctive elements, one of which belongs peculiarly to the Department of Works, the other to the Department of the Officer of Health.

I have made this digression in order to explain what the first diagram apparently teaches, and now I shall return to the economic aspect which this diagram presents. You will see it in a moment in the second and third diagrams.

It will be seen that I have assumed that for each death from typhoid there are nineteen who do not die, at any rate, from this disease, although, as is too often the case, it supplies conditions by which the seeds of consumption obtain an entrance to the system and produce, sooner or later, their fatal effects as a sequel.

I have also assumed that each case of typhoid means the loss of a month to the patient and one month to the nurse, but have said nothing about the actual expenses of the sickness in physician's bills, medicines and undertaker's fees, all of which would be proper items in the loss of productive capital.

Taking, then, the figures as we find them, and with these approximately correct assumptions, we obtain the following for Chicago:

Cases .8 per 1,000 by 60 days for nurse and patient equals 960 days per 1,000.

And 960 days by 1,200 equals 1,152,000 days.

This divided by 300 working days equals 3,840 years, or the loss of the year's work of 3,840 men.

At one dollar a day this means the loss of $1,052,000 to Chicago for one year of sickness from typhoid alone. This rate would mean for Detroit a loss of $210,400, whereas Detroit actually did lose only $24,000. On the other hand, if the Detroit rate were attained by Chicago $800,000 would be saved, a sum which would pay the interest, at 3 per cent., on over $26,000,000 of capital to invest in new water works.

Without discussing the losses from typhoid further, I turn to the deaths from that other disease *par excellence* of this northern temperate region, viz: diphtheria.

I have had a chart arranged to show its prevalence as well. It must undoubtedly be considered the pest of our climate. Its microbe may multiply outside of the body like that of typhoid, but has in addition an extreme capacity for spreading by infection. From the tables I therefore draw the following conclusions, viz:

1. In a city or town with an average attention to sanitation we have a more or less constant presence of so-called sporadic cases, amounting, perhaps, in deaths to 3 or 6 per 1,000.

2. Under, however, peculiar seasonal atmospheric conditions (such as a prolonged, dry, warm autumn) the germs of the disease seem to freely

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devolop in organic filth, hence an extension of the sporadic cases takes place; but mark the difference with typhoid.

3. Each case of these becomes a new center, each house wherein a case occurs being liable to become a distributing point. Persons, and especially children going to school, spread it broadcast unless the strictest municipal supervision is exercised over these cases and the public school.

4. That since the direct infection is enormously more common than in the sporadic cases, we have in this fact the evidence that the deaths from the disease are in a large degree preventable, and hence form a most important factor in this question of the economics of sanitation.

Since 1880 this disease has undoubtedly had in the country, as a whole, a greater general prevalence than before, though its mortality in several years past has undoubtedly been lessening as compared with the cases occurring. This is but natural if we remember that its spores are vegetable and hence spread just as the spores of the black knot fungus have spread among the fruit trees. With regard to the latter we are aware that what is necessary to limit it is to remove at once a limb affected and burn the knot. We do not, however, imagine that the spores are all destroyed but only those which we have detected on the knot.

It is quite clear, then, that with diphtheria the imperative question in its limitation is isolation or removal of the infeetion in cases. This may, in large degree, be done by municipal regulations, intelligently and perseveringly administered. That this is done much more thoroughly in one city than another we are very well aware. Taking Detroit as an example: Here it appears that a single city had almost as many deaths in 1890 as had the whole Province of Ontario. Look across the river. We must remember that Windsor is the nearest suburb to the business portion of Detroit, and that there is a constant intercourse between the two cities. In spite of infection, therefore, being frequently brought to Windsor, the disease has been limited there by the active interference of one of the best officers in Canada, supported by most thorough regulations.

Compare Detroit with Hamilton, where the latter city has been under a most vigilant officer for ten years. There diphtheria has so steadily declined as to cause but a small percentage of deaths.

Observe what the losses mean. It may be taken as a fair average that one death occurs in every five cases of diphtheria. At least one nurse's services are constantly required for, say, an average of a fortnight. From these data it thus becomes easy to calculate, as in the case of typhoid, what the loss means. The rate of death is:

Typhoid, 5; 8 Diphtheria.

But we have assumed in the case of the first, twenty cases to one death, and with the latter five cases to one death. Hence the ratio of cases is:

Typhoid, 20; 8 Diphtheria.

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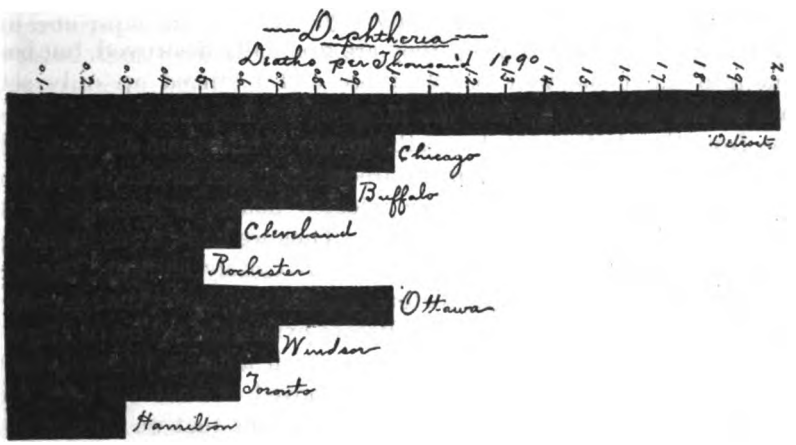
And if we assume that the loss in the latter is only one-third of the former in time, we can add what is probably below the real figure, about one-twelfth of the loss from diphtheria to the total average loss from typhoid for all the cities in the list.

Further comment seems needless. It surely is not necessary to add to all this the economic loss from doctors' bills, drug expenses and undertakers' charges, in order to show the extent to which these cities lose annually from imperfect sanitary methods.

We now must advert briefly to some of the methods which modern sanitary science has developed, and is still more rapidly improving, for overcoming the evils of defective sanitation.

Some of the important methods have already or will be set forth in the splended list of papers set down for discussion at the convention. I, therefore, need do but little more than refer to them. I shall do so in the following order:



First of all to be considered is *the house we live in.* Here we have to examine what is under the house, what is about the house, and what is within the house. As regards what is under the house, there are two principal things to be inquired into. With the presence of organic filth, which is *made-up soil*, from old refuse heaps, or filth from vegetables, etc., in the cellars, with moist walls, a house can hardly be made healthy. Cellars certainly can and must be kept clean and sweet. Lime-wash is a great cleanser, while concrete floors, etc., may help the first defect.

Boards decaying from damp in floors are most dangerous, and hence cellars must be drained. But this does not mean that we must let the water come in and then drain it off. Such cellars are always damp, the ground outside must be deeply drained, and to this end field tiles should be laid around the house and connected with field tiles laid in the same trenches with the sewers.

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As regards what is around the house, we have especially to remove all organic filth from house slops and yard refuse, to remove heaps and all garbage of lanes and alleys. Hence a systematic sanitary inspection of yards and lanes is a necessity, associated with a frequent and thorough scavenging department. Gradually all yards and lanes should be paved with cobble-stones, or bricks, or other rock material.

As regards what is within the house, cleanliness, or freedom from organic filth must be our watchword. Closets and dark spaces must be tabooed. The fewer carpets and woolen hangings the better, and weekly cleanings are infinitely better than the old half-yearly attacks made upon the stored-up filth. These remarks must apply with the same and even greater force to the school-room, where, daily, forty or fifty children sit for hours, and are constantly inhaling the dust tracked in on boots and shaken from clothing; this, in the house and school, often is the dust of disease. The germs found in the air of rooms are found to be a thousand times more numerous than those in the outer air, even of a town, unless on a windy day.

In the sunshine, with oxygen, they are gradually destroyed, but being borne into the house they collect there, and if stirred up only settle again on the persons and into the lungs of the house-dweller. Among these, from time to time, are borne the germs of infectious disease, either from the outer air, but much more frequently with the boots, clothing and breath of persons from other infected houses or schools, or who have been suffering from disease itself. Thus we know from experience that in the winter months, when houses are closely shut up, these diseases become most prevalent. It thus becomes apparent that municipal control of houses, where infectious disease exists, should be of the most positive character. If the infection is in such a house, it must, for the sake of present and future inmates, be removed at whatever cost. But as we know this is most difficult, it is reasonable that we should allow as few infected houses as possible. Hence it is very much better to have all cases of these diseases removed to isolation houses, hospitals, etc., where they are usually better treated and where infection can be readily destroyed.

But another most dangerous inmate of the house is sewer air. I venture to say that our experience in Toronto is not peculiar to that city alone; and there it is found that not one system of plumbing in twenty will stand the forcing of smoke under pressure into the pipes where defective joints and pipes abound.

Thus drain and plumbing inspection, after the most approved modern fashion, is necessary in all houses already built, and is very easy of accomplishment in every house being constructed.

The fewer plumbing fixtures introduced into a house, the safer does such house remain. But this house plumbing has its exit into public drains and sewers. These in old towns are commonly most defective.

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They breathe sewer air at our feet, and, if obstructed, dam back sewage into our houses. Good sewers become a necessity where public water supplies are found, and public water ought to be in every town. There is no village, town or city of many years' growth, where houses are at all aggregated, where wells can be considered a safe source of drinking-water. While in most instances public waters are to be preferred to wells, the general distribution of a single water-supply makes it of extreme importance that the supply should be free from pollution; for if a public supply be polluted, then disease spreads over a city like a pall.

In Ottawa, in 1887, when the public water-supply was led in a wooden pipe about half a mile from that mighty river, a quarter of a mile wide, with no towns above, 1,500 cases of fever appeared within six weeks. It was subsequently found that this pure water was, in the short distance of a quarter of a mile, polluted by several private sewers, which ran into the aqueduct or canal in which the wooden pipe was laid, and which had been constructed to obtain water-power to drain the pumps.

An iron pipe, afterwards laid elsewhere, removed the danger. Need I do more than refer you on this point to the several lakeside cities in our diagrams? Such, in a few sentences, are the principal matters requiring our immediate attention. Such questions as our food supplies —notably our dairy supplies—produced on premises proverbially filthy, cannot receive too much attention. Workshops, factories, etc., have all their special difficulties and dangers, and demand constant and intelligent attention on the part of those having them in charge.

Many other matters require remark, but our time forbids. There is one other point of sanitation which, however, we cannot overlook, and it is this: If a close study be made of the records of our prisons and asylums, we find there that what may be called moral sanitation is in need of greatly increased attention.

England, as we have seen, has a wonderfully developed system of sanitation, and yet she has 18,000 prisoners, 10,000 in penal servitude and 90,000 imprisoned annually on summary convictions.

Several years ago the annual expenditure in the United States for intoxicating liquors was nearly $900,000,000. All are aware how closely allied is the list of the criminal, the insane, and the inebriate to the cost just given. It thus becomes apparent that from an economic standpoint these conditions create an enormous loss. The moral are taxed to support others, who, through disease, imprisonment, poverty, etc., are non-producers—there being thus a double economic loss. It is thus manifest that, as in ordinary sanitation, the interests of the clean are inseparable from those of the unclean.

As has been well said by Sir W. H. Michael, Q. C., an English economist, "It is impossible for us to protect ourselves without caring for the less-favored of the community. Their crimes and their ignorance are their own. Their health is of us, their condition reacts upon us, and in caring for them—in attempting to guard ourselves from injury—we pro-

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tect first their interests, that we may be protected, and in helping to provide them with the requisites of public health—food, shelter and clothing—we provide the very first requirements of self-preservation."

Difficulties to Overcome.

By S. S. JONES, ESQ.,

Editor Carbondale Leader, Secretary Board of Health of Carbondale, Pa.

Ever since the fateful morning that witnessed the forced and presumably hasty exit of our first parents from the delightful garden—their first home—man has had no lack of tangible ills to worry over. Immediately following his eviction he was ordered to maintain himself by his own exertion, forced to toil and perspire, with no immediate reward except, perhaps, the hunger-sauce that makes humble-pie palatable. Man's difficulties are supposed to have commenced with the knowledge that he was for the remainder of his life to shift for himself, and they have continued to come in one form or another ever since. These everyday trials have served to develop every peculiar phase of human character, yet all the inhabitants of the world may be grouped in three classes, viz: First, those indifferent mortals who avoid difficulties for the reason that work is extremely distasteful to them; and any condition that insures freedom from toil and the payment of municipal taxes usually satisfies this ambitionless class.

Second, the chronic grumblers—the men who are so blind to their best interests that they never see anything but difficulties, yet in some inconceivable way they are possessed with the idea that they have inherited all there is of value in the whole world. Among this class of dissatisfied mortals may be found men and women who surround themselves with every luxury that money will procure, but invariably refuse to join in a movement by which their less fortunate fellow-men may share, in some degree, what purely selfish men enjoy. This class furnishes the obstructionists and so-called high kickers, who are always ready to oppose every movement in which the masses have a reasonable right to be interested.

Third comes the broad-guaged, public-spirited, progressive man, who believes that it is man's first duty to take care of himself and his neighbor at the same time. These men court difficulty, laugh at the obstacles set up by chronic fault-finders, fill with the enthusiam the indolent, shiftless drones who burden every community, convincing the doubting ones that difficulties are but angels in disguise, with whom a wrestling match would prove advantageous and secure to the victor temporal blessings innumerable. It is in this division of the human family that the active reformers are to be found—men who have no

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time to celebrate a dead past, who have time and tireless energy to devote to a living present.

Among the various agencies now at work in this and other lands, having for their object "making life worth living," none deserve from the people, and from all the people, such hearty co-operation and practical assistance as the organizations working under the direction of the State Board of Health; but men who engage in this line of reform work soon learn that the people in many localities refuse to take kindly to the rules, and are far more ready to hinder than help in a matter of such vital importance to the public.

There is reason to believe that sanitary reforms, wherever attempted, are always attended with serious difficulty; and the size of the obstacles that obstructionists place in the way of the reforms are usually proportionate to the work undertaken.

It has been the experience of at least one board of health in this Commonweath, that sanitary regulation demands of the men engaged in it a vast amount of hard labor and exercise of every virtue enumerated in the code.

It is all well enough in theory to talk about men who have the courage of their convictions, who are willing to sacrifice personal popularity, business prospects, everything but the hope eternal, in order to insure the success of sanitary reform; but the fact is that there are few localities on this sphere that can furnish enough of the particular kind of timber necessary to stiffen the spinal column of the majority when the local board of health finds that conditions exist which demand that sanitary laws be enforced regardless of the high character, political power or social standing of the men who neglect or refuse to comply with the results.

In communities where the surface signs indicate indifference to the ordinary comforts of life, a low order of civilization is generally found. The exterior marks are a pretty safe guide in talking up the special requirements of the community when the subject is discussed at a meeting of the local board, or at a convention called to discuss sanitary questions; but the difficult work begins with the first attempt to put in practice the reform-work suggested, to inaugurate the changes proposed. At first the movement may not meet with very decided opposition, but it likewise receives little encouragement, and when it is found that all classes come under the law, the new departure becomes decidedly unpopular.

One of the strange freaks in human nature is discovered only when uniformity in sanitary observations are sought after; when an inspection reveals to the self-satisfied householder that his premises require quite as thorough work as does the home of his neighbor of whom he has complained. Every locality has its quota of "very clean residents," who are loudly in favor of the general cleaning until they find them-

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selves included in the number who must comply with the rules. The notice to "clean up" is a positive crusher to such people, for they imagine that they are better judges of sanitary requirements than the members of the board of health, and, once aroused, these very nice people frequently become the pronounced enemies and bitter opponents of systematic sanitary reform. Plain, unvarnished truth is good medicine for one's neighbors, but for the neighbors only.

The people as a rule have much to do in the way of creating sentiment for or against every reform movement, it is only the mob who declare all sanitary law contrary to public policy. The great mass of people, however, are peculiarly unfortunate inasmuch as they are either unable or unwilling to see and admit the advantages of thorough and systematic sanitary regulation. They object to the restrictions and condemn the departure as an innovation that interferes with their rights as citizens of a free country. Such is in substance the foolish claim of many otherwise intelligent people, and nothing short of practical demonstration by enforcing the laws will convince this class of citizens that they hold erroneous views of sanitary work. The opposition of the masses is of course the chief obstacle that reformers meet with, and the conservative men engaged in sanitary reforms argue that the prejudice can only be overcome by educating the obstructionists until their eyes are opened and public sentiment drifts over to the side of right and practical reform.

Creating sentiment in favor of sanitary regulation is decidedly slow work in communities where an element that will not be convinced holds the reins of government, where many of the public offices are occupied by men who are too stupid to comprehend the wisdom of sanitary measures and too cunningly politic to permit the existence of a department of the public service that they cannot completely control. The opposition to the maintenance of the board of health in this city was confined to the minority party in councils when the department was first created, but the opposition has grown during the year and a half of the board's existence, and this is due entirely to the activity of the members of the board and their effort to administer the laws as they believe it to be their sworn duty. They do not discriminate in enforcing the rules, and men in authority are not, in their opinion, entitled to privileges that the common people are denied. Among the first to refuse to comply with the rules was a member of the upper branch of council, one of the largest owners of realty in the city, and when he learned that the sanitary department was no respecter of persons, he tried to get even by cutting down the item of the health department in the general appropriation ordinance, and just at present he is likely to succeed in his scheme. This is one of the difficulties that is, perhaps, confined to this city.

In several instances where it has become necessary to commence pro-

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ceedings at law against persons who violate the local ordinances, the local courts decline to give the board the support it is entitled to. One of our aldermen recently ruled that connecting a wash-bowl drain-pipe with the public sewer was fully complying with the notice to connect the premises with the pipe line, allowing the closet drainage to continue to empty into a vault which he had been directed to abandon. In a number of instances, where clear cases for conviction were brought, the court refused to impose the fines, and discharged the parties arrested. But this order of difficulties is being overcome gradually.

Physicians, too, are given to helping the kickers occasionally in order to please their patrons, and contagious disease cases are not reported promptly; but the doctors are easily managed when they learn that the law has been violated and that the board means business.

Now, these are simple instances of the difficulties that are met and overcome, and show, too, how little consideration is shown the board of health in one city of this great Commonwealth by the local authorities and the people with whom the members of the board come in contact. The same difficulties doubtless confront other boards, but these of which we know we have described. The time will come when trifling obstacles will vanish and difficulties will no longer stand in the way of perfect sanitary regulation.

This happy condition may be expected very soon after the people, feeling the need of perfect drainage and cleaner surroundings, will come together and by concerted action secure for themselves what the members of the sanitary organizations have for years been trying to provide.

Compulsory Domiciliary Quarantine against Diphtheria.

By J. H. MONTGOMERY, M. D., of Erie.

During the early part of February of the present year, considerable space in the daily papers of the larger cities, was devoted to the discussion of the recent appearance of typhus fever at one of the large seaports, and the probability of the disease spreading.

Typhus fever had just appeared in New York, attacking a number of newly arrived immigrants, mostly Russians, who made the trip in a densely crowded steamer. It was afterward learned that many of these people had spent some time in lodging-houses containing typhus fever patients, previous to embarking for America.

With the first outbreak of the disease, the New York Board of Health at once took active measures to prevent the disease spreading. All the

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immigrants were traced as far as was possible, and as many as possible were placed under quarantine, until the usual period of danger was passed, and all cases of the disease removed to the hospital for contagious diseases. All premises occupied by typhus fever patients were thoroughly and carefully fumigated by the officials of the New York Health Department, and every vessel arriving from a port where typhus fever was prevailing, was quarantined and fumigated before being permitted to approach the city and land her cargo.

Owing to the strict measures employed, there have been but few cases outside these immigrants. The additional cases have occurred among those exposed to the disease in patients in the hospital for contagious diseases, so that practically the epidemic was limited in extent and confined to a small area, viz., the island in New York bay, whither all the typhus cases have been removed and where they now are. Up to March 18, there had been 155 cases, with 26 deaths, a mortality of about 16.8 per cent.

Typhus fever is a disease requiring considerable exposure before contracting it. The crowding together of those sick with the disease seems to intensify the poison and to render its transmission more likely. It is directly contagious, and is transmissable by the atmosphere, though, as abundant evidence goes to show, only to a limited extent, perhaps only a few feet. It is probable that the poison can be conveyed by clothing worn by patients suffering from the disease. At any rate, it is not the most contagious of the contagious diseases.

The mortality of typhus fever is variously stated to be from 10 per cent. to 18 per cent. Murchison states, that, after excluding deaths resulting from sequelæ, the mortality is about 10 per cent. Among children, the death-rate is remarkably small.

Collie, of London, gives the following:

London Fever Hospital, up to age of 14, 1.78 per cent. (Ency. Dis. Child., vol. 1, p. 501).

Easton Hospital (Fever), up to age of 14, 1.76 per cent.

Southwestern Hospital (Fever), 3.84 per cent.

For purposes of comparison, let us look at the percentage of deaths occurring among the other severe contagious diseases:

Yellow fever, 50 per cent. (Bemiss, New Orleans, Pep. Sys. Med., vol. 1).

Yellow fever, 29 per cent. (Guiteras, Charleston, Ency. Dis. Child., vol. 1).

Yellow fever, children, 10 per cent. (Guiteras, Charleston, Ency. Dis. Child., vol. 1).

Small-pox, 15 to 50 per cent. (Hyde, Pep. Sys. Med., vol. 1).

Cholera, 50 per cent. (Stillé, Pep. Sys. Med., vol. 1).

The mortality of children from small-pox and cholera I cannot find expressed in figures. It is stated to be very high in small-pox, decreas-

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ing with the age of the patient. The above figures are only an average, and will be found to vary in different epidemics.

The disease first spoken of, typhus fever, was vigorously combated at the beginning of the recent outbreak in New York, and with success, so far as preventing its spreading either over a large area or among people beyond those necessarily exposed to the disease.

Were a case of small pox, yellow fever, cholera or typhus fever to appear in any city or town, the proper authorities would at once remove the patient to a hospital for contagious diseases, or, in the absence of such a building, would isolate and quarantine the dwelling entertaining such a case. All persons exposed to the disease would be quarantined until the usual period of incubation was past, and, after the recovery, the premises occupied by a patient would be thoroughly and completely disinfected and fumigated by the best-known means before it would be again occupied. The consent or wishes of the patient or landlord would not be asked. Very little opposition would be offered; in fact, assistance rather than opposition would be offered to render the abode free from the risk of contracting a dangerous disease. Were such precautions not taken by our sanitary and health officials, severe censure from the press and public would follow the neglect of those in authority to prevent the spread of the disease.

Since September, 1891, our city has been visited by an epidemic of diphtheria, there having been from September 21 till March 25—according to the records of the health department—261 cases, with a total of 105 deaths from the disease, giving a mortality of 40 per cent. This is larger than the mortality of typhus fever, which, in the present epidemic, was 16.8 per cent., and, as a rule, is not over 18 or 20 per cent.—about equal to the average mortality of small-pox, though probably less than it would be in small-pox patients of the same age—greater than that of yellow fever for the corresponding age, and about equal to that of cholera. It should be borne in mind that this mortality of 40 per cent. was only for this particular epidemic. In some epidemics it would doubtless be less, in others greater. Jacobi, of New York, is authority for the statement that in some epidemics it reaches 95 per cent. (Pep. Syst., vol. 1, p. 692). If this be true, we know of no disease that may be attended with greater fatality than diphtheria. All the diseases against which such strict sanitary measures are directed to prevent their extension—viz., small-pox, yellow fever, cholera and typhus—are infectious, communicable and contagious. The poison can be transmitted by the atmosphere, is capable of clinging to inanimate objects for an indefinite length of time, and then, under suitable conditions, developing again.

In comparison with the characteristics of these dread diseases, let us see what diphtheria has in common with them. Jacobi states: "Hardly any disease clings so tenaciously to solid and semi-solid bodies, and, in this way, is transmitted even after a long time. Hardly any disease

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clings so tenaciously to dwellings and furniture. It can be transported through the air—though probably not to any great distance—certainly transmitted by spoons, glasses, towels and handkerchiefs used by the patient." . . . . "The character of the disease communicated and local manifestation do not depend on that of the original sufferer; thus, mild cases may produce severe, and *vice versa.*"

Practically, then, diphtheria is a disease that is contagious, infectious and communicable—as we know the other so-called contagious diseases to be—and is attended with a mortality almost as great.

Let us consider for a moment what course would be pursued were a few cases of small-pox or typhus fever to suddenly appear in the midst of a community—a possibility at almost any time—and, for purposes of further comparison, let us make the same inquiry concerning yellow fever or cholera, which, fortunately, is not probable, except at a seaport.

In response to this question, the reply of ninety per cent. of the people would be, in substance: "Remove such cases to a pesthouse or hospital for such diseases, if one exists; if not, isolate the patient and all who have been in contact with him, until all danger of the disease developing in those exposed is over. Disinfect and fumigate the dwelling, and do not allow anyone to occupy it until such precautions have been taken." Why are such precautions necessary? may be asked. The substance of the reply would be: "Because these diseases are certain to spread, unless the proper measures to prevent are taken at the start, and are attended with great mortality; and unless the necessary precautions are taken, an epidemic of the disease is sure to ensue, and many deaths result, the mortality of these diseases being great."

It has been shown that diphtheria is a disease infectious, contagious and communicable, and, like the others, its poison has the power of clinging to various objects—such as clothing, furniture, bedclothes, playthings, etc., for an indefinite time, and then re-developing, thus causing new epidemics of the disease: its mortality is greater than in typhus fever, as great as in small-pox, yellow fever or cholera, and in some epidemics may even be greater than in these diseases.

What should we do when diphtheria appears in our midst? Have we taken the same precautions to check its spread as we would if typhus fever, yellow fever, small-pox or cholera were to appear? No! Is it not practically as contagious and the cause of as many deaths as any of the other infectious diseases? Yes! Have we been careful to isolate cases of the disease at the start, and quarantine those exposed, until danger was passed? Have we carefully and thoroughly disinfected and fumigated infected dwellings before permitting them to be again occupied? In fact, all efforts in this direction have been greatly resisted, and the disease soon spread to a point beyond control.

Contrast for an instant the apathy and indifference shown by the public in taking the proper steps to prevent the spread of this fatal disease

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and the interest and anxiety to check the spread of the other diseases that are commonly called contagious. Were the same indifference and neglect shown in cases of small-pox, typhus fever, cholera and yellow fever, extensive epidemics would follow, and countless lives would be lost, which are now saved by the enforcement of sanitary measures Instances have been known where the public, during the prevalence of an epidemic of diphtheria, were content to sit with folded hands and see child after child die, and even go so far as to refuse to assist sanitary officials acting in an official capacity to prevent the disease spreading. The public were rewarded by seeing the disease spread, and numbers of children carried off who might be living to-day, had the epidemic been checked. What should we do when diphtheria makes its appearance? There is but one answer: To use exactly the same measures as would be employed against the other contagious diseases having a high death-rate, and which spread rapidly unless vigorously combated at the first outbreak.

Completely isolate the very first cases; quarantine every exposed person; until all danger of the disease developing in those exposed is over. Fumigate thoroughly the dwelling occupied by such a case, before permitting it again to be occupied. Prompt removal of the first cases to a special hospital, with quarantine of those exposed, would effectually check the disease.

Diphtheria being essentially a disease of childhood, there would doubtless be a popular prejudice against forcible removal of the little sufferers from the mother's care, and it is doubtful if a law to this effect could even be enacted. Fortunately the same object can be accomplished by another method, and one that is applicable to every community however small—viz., complete isolation and quarantine of every dwelling containing a case of diphtheria, until it is well, and until sufficient time has elapsed for all exposed to be free from danger; complete and thorough fumigation of the dwelling, and destruction by fire of all clothing and bed-clothing used by the patient during the attack. That complete domiciliary quarantine of a house or houses containing an infectious disease is possible and practicable, has been repeatedly shown. An instance fresh in the minds of many is the outbreak of small-pox a year since at Johnsonburg, Pa.; here compulsory quarantine was rapidly enforced, and the result was that the epidemic was quickly suppressed.

To obtain this end, the willing and hearty co-operation of the public with physicians and sanitary officials is absolutely necessary, and this alone is not sufficient. We must have the laws necessary to accomplish this enacted, with full power to enforce them, and sufficient appropriation to defray the expense entailed. In no other way can the necessary isolation and quarantine in an epidemic of diphtheria be obtained, and this is the only method by which we can hope to eradicate this disease,

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as we have done with small-pox and the other infectious fevers. In a very brief time the good results accomplished would teach the public to regard diphtheria in its true light, as being equally dangerous as the other dread diseases, and their hearty assistance would be given our officials in their good work. Until we secure this power and the means to accomplish it, we will see diphtheria spread and countless lives sacrificed—many of which would have been saved, had the disease been vigorously combated at the outset by that good system of Compulsory Domiciliary Quarantine which has been so successfully employed in infectious diseases.

THE PREVENTION AND QUARANTINE OF SCARLET FEVER.

By E. CRANCH, M. D., *Erie, Pa.*

Although this paper is to treat of so inflammatory a subject as scarlet fever, it will not be necessary to use any inflammatory language, or to magnify the subject; it is only intended to attract attention forcibly to some wholesome and unwholesome truths in regard to scarlet fever and its sanitary management. It is admitted by all that scarlet fever is abroad in the land, and that it is in the highest degree contagious; that it spreads by contact, by air, by clothing, even by letters and books, and certainly by dogs and cats and other domestic pets, such as toys and house flies, in their migrations from house to house.

Two or three cases, well known to the writer, will illustrate the ease of its transfer from an infected house to any unwary by-traveler or visitor who happens to be susceptible to its blandishments. Of course, one who has had it, does not need to fear its effects, beyond the chance of a sore throat, generally absent and seldom severe. But all visitors, and especially attendants, may act as carriers from the sick to those who have never had it.

Let no one speak too lightly of it, though so many cases are and have been light, for who knows how soon its blasting touch may wither the fairest blossom in the garden of our hopes, or how soon its scarlet conflagration may be a signal of devastation in some happy home, causing the grave to yawn for the best beloved of many a household. God grant that its ruddy terrors may be held in check for us, and that its baleful torch be not lighted on our hearthstones.

To show the way to turn it aside, to show its burning destruction, is in some measure the object of this paper, not alone by the essay itself, but still more by the discussion that it is earnestly hoped and intended may follow this appeal to caution.

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Well, the cases of contagion alluded to were these: first, a boy living in the country was sent a long way off to bring home a goat, and was charged to avoid a certain neighbor's house, where scarlet fever was in full possession. Going out, the obnoxious house was easily avoided, but on the return the goat was willful and insisted on dragging the unlucky youth right over the porch of the prohibited mansion, when just then the door was opened, and a full breath of the tainted air inhaled by the panting driver of the wicked goat. It was only a whiff, but it did the business, and in one week little Jabez justified the bad omen of his name by "bringing sorrow" in the shape of a fine case of scarlet fever.

Another case was contracted by waiting on the doorstep of a house and then joining a caller, who had only gone in for five minutes, but long enough to bring out a supply of scarlet-fever poison in the air that clung around him. One more case was that of a young girl whose mother had a dress come home from a house where there was a recent case of scarlet fever. The dress was undone and tried on in the little girl's presence, and in a week she had the fever, with no other possible source of its infection. The poison is one of the most diffusive of all, and easily retained by the clothing, furniture, carpets, walls, etc., of any room it has been in. Yet a closed door *may* be enough to keep it in a room or house, and a few minutes in the open air *may* be enough to scatter it free from the clothing, but in all such cases there is more or less risk of contagion.

Very much to be dreaded is this quick, subtle, yet evanescent poison, for it has done much to fill our cemeteries, our deaf-mute schools, our insane asylums and our hospitals for chronic diseases.

In the hope that strict isolation and preventive measures may some day make the scarlatina or scarlet fever or scarlet rash (for these are only names of the same disease) as comparatively rare and as much under control as the dreaded small-pox, the subject of prevention will now be spoken of at some length.

Prevention, or prophylaxis, includes both prevention by medicine or disinfection, and isolation or quarantine. We will speak first of medicines that may be taken to lessen susceptibility, and reduce the chances of contagion to those taking such medicine. In the case of small-pox, the use of the modified virus of a kindred disease known as cow-pox, has long been used by inoculation, called vaccination, to prevent or limit the violence of the true small-pox. But the inoculation by the blood presents so many dangers in the way of the introduction of animal diseases and septic virus, that the only safe mode of practicing such protection seems to be the exhibition of the modified virus of the cow-pox by the mouth—experience showing that the digestive juices resist the complicating poison better than does the actual blood of the scarified or "vaccinated" arm. Just so in scarlet fever; it is obviously not possible

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to safely inoculate the blood with any modification of so subtle a poison, but in a kindred vegetable poison, the juice of the deadly nightshade, belladonna, we find at once a preventive and a remedy for the great majority of cases.

The mistake commonly made, and the most frequent source of failure in the use of the potent belladonna as a preventive or as a remedy, has been and always will be the using of belladonna too strong. It must not be given, as some have tried it, in doses of the extract sufficient to dilate the pupil of the eye; but let it be given in an infinitesimal portion, such as is found at the homœopathic pharmacies under the name and rank of the two hundreth potency of belladonna, and let a dose be given once or twice a week during the exposure, if in the same house, or once a month if only in the neighborhood, and the disease will either not be taken or its manifestations will be slight.

In all cases, however light, the same care and watchfulness are always needed to guard against possible complications and sequelæ. Prevention includes, further, such means of disinfection in the house and room as will lessen the violence of contagion, and at the same time not be injurious to the patient.

The burning of sulphur is valuable; but, as Dr. Squibb has pointed out, no thorough work is done by dry sulphur smoke; it must be rendered moist by the presence of the vapor of water. Dry sulphur smoke does not seem to lay hold of the germs; but it may be easily moistened in this way: Stand the dish or can containing the sulphur to be burned in a dish of water, or in a dish of wet sand, or let water be boiling on a stove close by; and by these means you will be able to vaporize enough water to moisten the sulphur fumes and render them sufficiently active.

It is proper to protest against the burning of sulphur or of any acrid smoke in the presence of the patient. The makers of Spencer's fumigating pastilles, which contain a portion of bichloride of mercury, claim that they may and should be burned around the sick bed; but personal observation has proved that much harm may result from such poisonous fumes. Although the patient may tolerate them, it is because sensation is lessened in such cases, for those who speak of it say they have felt a swelling and aching of the throat, and a manifest increase of fever, as the effect of using the pastilles too close. If boards of health are to have unlimited power, let them be very sure of their facts, for the experience of to-morrow may, as it often does, upset the theories of to-day, and condemn the practice based on such theories. The physician should be progressive, and feel tied to no rules so fast that he will not give them up if he sees a better way.

Another very useful disinfectant in the sick room, as well as near it, is the solution of the chlorides known as Platt's chlorides. It may be used by cloths wet with it hung up round the room and over the doorway of the

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room, and used to wet the carpets and clothing when these are brushed and scoured.

Still another plan proposed is the burning or vaporizing of eucalyptol and turpentine. These may be useful, but at the same time must be used with caution about the scarlet fever patient, for fear of irritating the lungs and the kidneys, which are peculiarly sensitive to these pungent agents.

Penciling the throat and nose with antiseptic applications is also of very dangerous utility, it certainly cannot destroy the contagion, and it may be of great danger to the patient.

All personal discharges from the nose or mouth and elsewhere should be at once burned up or promptly disinfected, but the body of the patient cannot safely be subjected to such treatment.

The value of fresh air in the house and room is incalculable; fresh air and sunshine will destroy all the poison as quickly and more safely than many of the common disinfecting agencies. Sufficient warmth must always be had, but fresh air is imperatively demanded. All dishes and clothing used should be kept separate and cleaned by themselves. Persons in attendance on scarlet fever, however thoroughly they may have had the fever themselves, are frequently liable to a sore throat, often of a diphtheritic character, for the poison seems always first to attack the throat. This secondary sore throat may itself be contagious, though slight in itself, and therefore is a proper source of solicitude.

An occasional gargle of water containing alcohol or brandy, and the daily use of a dose of belladonna 200th, will generally prevent such sore throat.

Let as few as possible be around the sick with scarlet fever, and exclude all visitors, even those who may have had it. Let those who go out to work, or to purchase for the family, be others than those who nurse the sick in the house, and let the city and the physicians see that no one suffers by too great isolation; no starvation or cold should be forced on any household because of the necessity of protecting other citizens. But no good end is ever gained by concealing the fact that scarlet fever is present, and the placard should make the fact public. When inmates of an infected house are abroad, they should avoid crowded places until they have been some time in the fresh air, or have exposed themselves to the vapors of moistened sulphur smoke.

In regard to schools, it is proper that children from a scarlet fever house be kept at home long enough to be sure they will neither have it themselves nor carry it to others. Most of the harm in spreading the disease is done by letting the little patients out among their playmates before they have fully recovered.

We are now right in the consideration of the last form of protection—quarantine, with its necessary isolation. The Academy of Medicine of Paris, France, in 1882 adopted a rule fixing the period of isolation proper

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for scarlet fever patients at forty days. At the same time they ordered that other diseases should be kept by themselves, thoroughly isolated, as follows:

Small-pox, forty days; chicken-pox, twenty-five days; measles, forty days; mumps, twenty-five days; diphtheria, forty days; followed by bathing and change of clothes, the old clothes to be baked, fumigated and scoured before subsequent use. The custom in Erie is to observe a much less period of isolation, often too much less, with great danger of spreading the diseases. Several oversights have prevented the writer of the present paper from cabling to Paris for advice as to whether these rules of isolation are still in force, but it is presumed that they are.

One very important reason why scarlet fever should be so carefully isolated even by aid of placards on houses, which have not yet been used in Erie, is the fact that any case of scarlet fever, known by other names, as scarlatina and scarlet rash, may give rise to, or be complicated with, diphtheria; and it is a fact capable of the strongest proof that many cases reported solely as diphtheria are in reality forms of scarlet fever, while the results are just as fatal and as disastrous as in diphtheria of any other form.

This relation of the poison of scarlet fever to the production of diphtheria is not enough known to the public, for it is a fact that any case of scarlet fever may have or may give rise to diphtheria in its worst forms. And it is important to recognize this, for scarlatinal diphtheria is not only just as dangerous as common diphtheria, it is even more dangerous in its liability to affect the kidneys, or to be followed by extensive ulceration and sloughing of the throat and ears.

Scarlatinal diphtheria also often demands a different treatment, and one child at least is believed to have died a victim of diphtheria, the fact that it was caused by scarlet fever not being known till after death, when the next door family was found to have had scarlet fever, but thoughtlessly or wickedly kept it concealed. How important is it then that every case of scarlet fever should be most thoroughly known, by report and by placard, and the quarantine enforced a sufficient number of days to be effective. It is not to be denied that light cases will always be apt to escape notice or recognition, and so keep the disease going, but it is none the less our duty to keep up the reporting, placarding and isolation of all known cases of scarlatina and the administration of the homeopathic dose of belladonna to well neighbors as a preventive.

Forty days may seem an unreasonable long time to isolate a case that may be well long before the forty days are over; but when we think of the peeling of the skin that follows scarlet fever, and the terrible results that are liable to occur from a lack of caution during convalesence, both in the shape of danger to the patient and danger to the neighbors, and

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the certainty of contagion to all concerned who are in any way susceptible, it seems as if forty days were none too long a time to keep the patient himself secluded, although under proper precautions of fumigation by moist vapors of sulphur and plenty of fresh air, other members of the family may be permitted to go about as usual, before the expiration of the forty days. All books, toys and clothing used during the period of isolation should be removed, destroyed, or thoroughly baked and disinfected, the walls of the room may be rubbed with slices of fresh bread, to remove all germs, and then newly papered, whitewashed or calcimined before new tenants are allowed.

It is not the place here to say much of treatment, only to call attention to the dangers of taking cold, the great and often fatal dangers of the external use of cold water, in baths or cold packs; the danger of the common chlorate of potash, as liable to bring on fatal inflammation of the kidneys; and the importance of calling a physician early in the case.

As a parting word, remember that scarlet fever, besides its own many and great dangers of deafness, dropsy, stiff joints, etc., may have with it, or give rise to, the worst forms of diphtheria, and that belladonna 200th and complete isolation are its best preventives.

The Enforcement of Sanitary Rules.

BERIAH EDWIN MOSSMAN, M. D., GREENVILLE, PA.

MR. PRESIDENT AND GENTLEMEN OF THIS CONVENTION: In the short space of time allotted me, I desire to say a few words on the subject of sanitary legislation and its enforcement. It is a subject that has received any amount of attention from sanitarians in this State for many years, and is yet far from being settled in a manner satisfactory to the minds of medical men and those interested in sanitary science. It is the foundation upon which all our work must rest. Without good sanitary laws it will be impossible to have thorough organization that will reach every town and borough in the State.

A careful review of the laws relating to hygiene on the statute books of the Commonwealth of Pennsylvania shows that considerable legislation has been passed, with a view to the protection of the public health. The first act was passed January 22, 1774, over one hundred years ago. (MS. Laws, chap. 289.) Since that time numerous acts have been passed, some of a general character, and some special laws relating to certain municipalities. The whole mass of legislation is, to a great extent, of a desultory character; and while many of the acts are truly valuable, they need trimming and amending, so that they may apply to every incorporated borough or city within the limits of the State.

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The most important act was passed June 3, 1885, which created the State Board of Health. Nearly all the existing boards of health throughout the State were organized under the laws of May 23, 1874, relating to cities of the third class—that is, cities of between ten and one hundred thousand people. The law regulating the sanitary powers of boroughs was the act passed April 3, 1851.

This law places in the hands of the burgess and council sufficient power to maintain a good sanitary condition within the borough limits, but as no one officer is given special power of responsibility in the matter it is neglected.

In cities where the councils have authority to create local boards of health and appoint health officers who are compensated for their services, the sanitary laws are generally well carried out and the people receive the benefits therefrom, but this cannot be said of the boroughs that come under the act of April 3, 1851. I do not believe there is a borough in the State of Pennsylvania that is in a good sanitary condition, and the most of them are run regardless of any attention to the provisions of the act regulating the sanitary affairs of such corporations.

It is the custom in boroughs to appoint a street commissioner, whose duty is to clean the streets and alleys and superintend all works of construction within the borough limits. Complaints must usually be made to the burgess or council by the citizens who have any grievances they desire to have settled or any complaints to make about the sanitary condition existing in their locality. The private citizen must become either actually or substantially a prosecutor to accomplish what should be done for him by some responsible official. It is usually the duty of the street commissioner to attend to all complaints that are made or brought before the burgess or council. Existing evils are seldom corrected, and a deplorable condition of sanitary affairs invariably exists in most incorporated boroughs.

Sanitary organizations and work are almost entirely confined to municipalities, and there is an absence of any active interest taken in many places where local boards of health exist, and at the same time it is proper to state that in a number of incorporated cities of the sixth and seventh classes there are no boards of health or health officers. In many large-sized boroughs typhoid fever is present all the year round, seldom ceasing, and at times prevails to an alarming extent with many fatalities. The same can be said of visitations of scarlet fever and diphtheria that have assumed in interior towns almost an epidemic form, and have wiped out some families entirely. Efficient boards of health in such places would soon command the situation, and the enforcement of existing sanitary laws would arrest the progress of contagious diseases and save many lives that are unnecessarily sacrificed.

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The evils existing in all large sized boroughs are many, and to express my views clearly before this convention I will present the condition of one of our most thriving boroughs in the Commonwealth.

The place has 9,000 population and is a busy, thriving manufacturing town. It has no board of health or health officers, and the only person who takes any interest in the sanitary condition of the place is the street commissioner. Over 1,300 children daily attend the public schools. There is no sewerage and very poor surface drainage. The streets are not paved and are in very bad condition. Every spring the accumulated filth on the streets and alleys is carried off and some fresh road material is carted on. The back yards and alleys are made to receive the deposits of wash-water, dish-water, and all the refuse of the kitchen. In some few instances cesspools in the yards receive everything, including the pipes from the water closets, but most commonly the fearful, old-fashioned water closet stands in the back yard a source of terribly offensive gases. In this place typhoid fever is almost always present, diphtheria every season claims its many victims, and scarlet fever is generally present with its quota of deaths.

Too little regard is paid to the prevention of the spread of contagious and infectious diseases in rural districts by physicians and those in whose homes the disease exists. An effort is commonly made to conceal the fact of the presence of the disease both by parents and physician. Denials are made and neighbors exposed carelessly to infection. Scarlet fever, diphtheria and typhoid fever are concealed from the public. No notice is posted on the house as a warning, nor are there any quarantine measures taken. This is not right and should be held as criminal. Infected houses as well as disease-breeding yards, vaults, wells, drains, cesspools and other nuisances on private premises should be placed under strict sanitary police surveillance. It is unnecessary for me to comment upon such a state of affairs as every sanitarian well knows what should be done. This description of a growing, thriving town is but one of many such in the large State of Pennsylvania. Borough officials are commonly ignorant of the great powers invested in them by the act of 1851, and seem to labor under the impression that the only duties resting upon their shoulders are to see that the streets are properly lighted, mud holes filled up and crossings put in.

It takes time to accomplish all great works, and it will take time to place all the cities and boroughs in the Commonwealth in excellent sanitary condition. It can be done, and will be accomplished in the future, and this great task will have to be the work of the State Board of Health. Through this body local organizations should be established in every incorporated borough in the State. If the act of April 3, 1851, governing boroughs does not confer the power upon the burgess and council to create boards of health, let an act of general character, embodying all that is necessary, be presented to the Legislature. It is the

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duty of the State Board of Health to see that every borough has a local board or an active health officer, and this can only be accomplished by having the existing laws carried out, and wherein they are deficient so amended as to meet the requirements. This once accomplished, and every local board, municipal and borough, working uniformly under the laws and maintaining satisfactory relations with the State Board of Health, the great objects aimed at by the creation of the State Board of Health, and the enactment of the sanitary laws, will be secured.

I would suggest that the State Board of Health draw up a bill to be presented to the Legislature at the next session of that body, in which will be embodied a provision for the appointing of a board of health or health officer in every incorporated borough or township in the State of Pennsylvania, defining the powers or duties of such boards of health or health officers, and that the borough or township compensate such boards of health or health officers for their services, and that such boards of health or health officers work, under and in co-operation with the State Board of Health, as specified in the act of June 3, 1885, creating the State Board of Health. This bill should require the registration of births and deaths throughout the Commonwealth. In other words, a complete and satisfactory, general and uniform law should be made that will cover any point needed to establish a harmonious and systematic system of sanitary organizations in every city, borough and township in the State.

The Sanitary Utilization of Garbage and Refuse, and Destruction of Germ-life in Infected Material, Without Injury to the Article Treated.

By I. M. SIMONIN,

Civil Engineer, Philadelphia.

GENTLEMEN: The criminal, objectionable and unsatisfactory methods now employed in disposing of the garbage and offal of cities, and the primitive means used to prevent the spreading of contagious diseases, by the destruction of the least valuable of the infected material, and the feeble attempts made to disinfect that which seems too valuable to burn, are too well-known to the members of the State Board of Health to be enlarged on by me. The remedy for these evils, we think, is supplied by the process covered by letters patent, granted January 5, 1892, to I. M. Simonin, C. E., and C. F. Simonin, for utilization of offal.

The Simonin Process that it is my pleasure to bring to your attention, has been in operation for over two years, at Providence, and since that time many improvements have been added, and it was not until the same was perfected, both from a sanitary and financial point, that it was thought wise to make the process known to the public. During all this time the health officer of that city, Dr. Charles V. Chapin, has promoted the enterprise, both by advice and time, and to him much credit is due.

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This process not only disposes of the offal in a sanitary and inoffensive manner, but also effectively destroys the germs of all diseases, without any injury to the material treated, but which on the contrary is improved by the treatment. In case of an epidemic, this apparatus can be controlled by the Health Department, and used to disinfect, thoroughly and effectively, all infected materials. By this process the offal (garbage, dead animals, etc.) is not only treated without rehandling or sorting in a sanitary manner, but the materials are converted into plant-food and grease, both being valuable and necessary for the growth of the country.

This plant-food is known to the trade as tankage, and finds a ready sale. The average of the monthly analyses, covering a period of one year, made by Messrs. Stillwell & Gladding, Chemists for the Produce Exchange, New York, shows that the tankage contains 5 per cent. moisture, $4\frac{4}{10}$ per cent. ammonia, 9 per cent. bone phosphate of lime, and 1 per cent. of potash. The mechanical condition is perfect, and its dryness makes it of much value in the manufacturing of fertilizers, on account of the rapidity with which it will absorb any free acid or moisture present in the material with which it may be mixed. In itself, for many plants, it is a good fertilizer. The grease is used for manufacturing soap, candles, etc. The demand is unlimited, and the price is equal to that of greases of the same color. The industries in which these products are used are only in their infancy, and especially is this the case with the fertilizing trade. The demand for fertilizers is constantly increasing, and the sources of crude material do not increase in the same ratio.

The Quarterly Journal of Science says: "To economize nitrogen, potash and phosphorus—to recover these from waste—is the sacred task which chemists and engineers should take in hand. The reforms which shield us from pestilence, sink into insignificance compared with those required to guard posterity, in not a very remote future, from chronic scarcity."

The crops that a soil will produce are only limited in number by the amount of plant-food, water and temperature we supply it. The farms surrounding Paris produce from five to ten crops a year, and every crop many folds larger than that obtained from the most fertile soil in this country. To-day in Massachusetts alone, 906 farms are abandoned, each farm averaging eighty-five acres, and containing all necessary buildings for the comfort of man and beast. It will only be a short time before all the States will be suffering from the same trouble. The fertilizing material produced by this process contains every ingredient needed by plants, and if the offal of all cities was so utilized, plant-food would be so abundant and cheap that it would be within the reach of every farmer. Barren soils would soon be rich and fertile, waste places transformed into spots beautiful to the eye, and what was desolate and abandoned would be reclaimed and productive of much value.

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The Simonin Process is simple and entirely a chemical one. Garbage is a mixture of water, and animal and vegetable matter. The percentage of water being about 80, and any attempt to remove this by drying before the treatment, would be fatal to the commercial success of the process, and besides would prevent its use as a sanitary measure. To deprive it of its water in a cheap and sanitary manner, we enclose as soon as received the offal in a large cylinder, tested to stand 150 pounds pressure. It is in this cylinder, completely immersed in a chemical re-agent, with which water will not mix, and which at the same time kills all germs of disease, and in addition acts as a solvent for grease, heat being used in the operation.

The specific gravity of the water being heavier than that of the re-agent, a large part of the water is accordingly displaced, and the balance passes off with the vapor of the re-agent and is condensed and separated therefrom. A series of these immersions causes not only a complete drying of the offal, but frees it entirely of grease.

The expense to cities or towns using this system would be less than cremation, and it can be introduced profitably in towns producing as low as five tons of refuse daily. It is estimated that this amount is produced by ten to fifteen thousand people.

I append to this paper a report on the Simonin Process, made January 27, 1892, by Dr. J. W. Prendergast, to the Board of Legislation of Cincinnati, O., he having been delegated by the city to examine all known processes in use in this country for the treatment of garbage. His report covers the work for the utilization of offal, but questioning the claims that liquid hydro-carbon—the re-agent used in this process—destroys germ life, especially if used cold, he had a number of tests made under his personal supervision in his bacterial department, and his report on the same justifies our claim. That there is need of a better sterilizer than that now in common use is not open to dispute, hot air not being able to be supplied at a sufficiently high temperature without injury to the material treated, to kill all germ life. It is the hidden germ, or the germ we cannot control, that causes pestilence and epidemics. Cremation, while effective in destroying germ life, still is liable to permit the escape of germs before the heat is sufficiently high to destroy this life. The mass treated must first be heated, then subject to destructive distillation, and finally ignited. The moisture and gases that escape must carry germs with them, the most improved crematories being open to this objection, for the draft cannot be obstructed, consequently the vapors cannot be controlled. To obtain an ideal process, all parts of the infected material must be acted on the same, and this can only be done by means of an agent that will penetrate all portions of the material. This, we claim, is accomplished by the use of hydro-carbon, either in the liquid or vapor state. It is an exceptional case when neither of these can be used; and in this case we have connected

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with the same apparatus steam, which can be used, either by means of coils to heat the air within the cylinders, or it can be used as live steam, and, by means of valves, the heat and pressure kept under perfect control. The hydro-carbon used in the process is recovered, consequently the expense is nominal.

All of which is respectfully submitted.

APPENDIX A.

HEALTH DEPARTMENT.

OFFICE OF SUPERINTENDENT OF HEALTH,
CITY HALL, PROVIDENCE, R. I., *August 13, 1891.*

The Simonin Process for utilization of garbage has been adopted by this city, and it receives the unqualified approval of the health department.

(Signed) CHARLES V. CHAPIN, M. D.,
Superintendent.

APPENDIX B.

REPORT OF DR. J. W. PRENDERGAST.

THE SIMONIN PROCESS FOR THE DISPOSAL OF GARBAGE,
CINCINNATI, *February 23, 1892.*

To the Honorable Board of Administration:

GENTLEMEN: In compliance with your instructions, I have visited the City of Providence, Rhode Island, for the purpose of personally inspecting and investigating the process in use in that city for the disposal of garbage, and beg leave to submit herewith the following report:

Leaving here on the evening of February 5th and arriving at Providence on the morning of the 7th inst., I proceeded without delay to the garbage plant. It is located about ten minutes' walk from the center and rather to one side of the city.

Before entering I walked in every direction around the building to discover if there was any offensive odor proceeding from it, and I assure you that did I not know the nature of the business conducted therein I certainly should have been unable to distinguish from the sense of smell anything concerning the character of the trade.

The process has been in operation in the city of Providence for over two years. Improvements were being made constantly under the supervision of Dr. Chapin, the health officer of Providence, and it was not until January 5th of the present year, the day the patents were allowed,

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that the inventors felt they were ready to invite the world to inspect and examine the product of their genius.

The first impression was an entirely pleasant and agreeable one, for the reason that there was an entire absence of any disagreeable odor whatsoever in or around the plant.

The process is simple and entirely chemical, and one wonders that the well-known principles applied here had not been thought of before.

It is difficult, without a diagram, to make lucid anything concerning machinery, but an effort will be made to briefly outline the principal features of this process:

Two large buildings are used, one for the machinery used in the utilization of the garbage, consisting of large iron retorts, vaporizers, condensers, settlers, purifiers, etc., and the other building is used as a power-house and storage wareroom.

The garbage, on arrival at the works, is immediately placed on small truck cars, built expressly for the purpose, and without any handling or assorting of the mass whatever, is at once run into these large iron retorts referred to above.

These retorts are immense iron cylinders, 18 feet long and 6 feet in diameter, and accommodate three cars. On the floor of each retort is a series of steam pipes and at the opposite end is a valve which permits the entrance of the chemical re-agent. At the top of each retort are numerous ingenious devices employed in vaporization. As soon as three cars are run into the retort the open end is hermetically sealed, thus preventing the escape of any odors or gases.

The object of the invention is a twofold one: first, to provide a commercially successful apparatus whereby garbage can be treated for the purpose of recovering from it the constituents which have a market value, and second, to effect this result without occasioning a nuisance and in a perfectly sanitary manner.

The chemical re-agent used has a less specific gravity than water and also has a solvent effect upon grease or fat submitted to its action.

Now the retort is closed and filled with garbage. The re-agent is then allowed to fill the retort and it has the double effect of dissolving the grease and displacing the water in the garbage. The mass is treated in this manner several times without removing it from the retort or even opening the end of the retort. It has the final effect of completely drying the garbage, and I have in my office samples of both vegetable and animal matter treated in this manner, at Providence, under my own supervision.

Two products are derived from the treatment of garbage by this process, namely: first, what appears to be a valuable fertilizing matter and a grease which I am informed meets with a ready sale. There are various condensers, settlers, re-agent-holders, purifiers, vaporizers, etc., used in the process, which, it seems to me, do not need any detailed description.

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Such, in brief, is the Simonin Process and Apparatus for treating garbage.

Dr. Chapin, the health officer of Providence, who is familiar with every step of the process, and who, perhaps, has given as much time to the study of the garbage question as any other gentleman in the United States, unqualifiedly endorses this process.

Massachusetts being the recognized leader in sanitary matters, and Boston, the seat of culture, being an hour's ride, I felt it incumbent upon me to ascertain what her officials thought of this latest garbage process.

Durgin, of the Department of Health, while he feels that every householder should dispose of his own garbage, unhesitatingly recommends this method as the next best process.

Mr. Chas. Carter, a civil engineer and Boston's superintendent of street cleaning, also endorses it highly, and makes special mention of it in his annual report, which is just from the press.

Respectfully submitted.

J. W. PRENDERGAST,
Health Officer.

APPENDIX C.

DEPARTMENT OF HEALTH.

BUREAU OF BACTERIOLOGY, AND MICROSCOPY,
CINCINNATI, *March 15, 1892.*

J. W. PRENDERGAST, M. D., *Health Officer:*

DEAR SIR: Permit me, herewith, to submit, in compliance with your instructions, the following report concerning the germicidal action of naphtha.

My observations have been limited to the practical aspects of the question, both so far as the microscopic investigations are concerned, as well as the references to the literature of the subject.

In testing the germicidal action of naphtha I experimented with the more common forms of microscopic vegetable life which give rise to the process of putrefaction or are generated as products of this process.

It has long been held that all, or nearly all, of the coal-tar derivatives possess some disinfectant or germicidal properties. Among these chemical agents naphtha is said to have a specially high degree of bacteriocidal action. In testing the power of naphtha to destroy microscopic vegetable life, I selected putrefying substances which are most frequently found in the offal or garbage of the city, such as particles of meat, bone, potatoes, fruit of various kinds, parings, rags, etc. Since moisture or the presence of a small percentage of water is a condition favorable to the generation and development of the microscopic ele-

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ments of decomposition, putrefaction or fermentation, I also subjected some of the fungi found in stagnant water to the action of naphtha.

I. The different kinds of mould fungi, found upon moist cellar-walls, etc., seem to be quite susceptible to the action of naphtha. I succeeded in completely stopping the growth of these fungi by exposure to naphtha. In referring to the literature upon the subject, I found a statement by Klebs, to the effect that the odor of certain coal-tar products will lower the multiplying power of the cells of the mould-fungi.

II. A particle of flesh in the incipient stage of putrefaction was found to serve as a culture-soil for at least three distinct kinds of vegetable organisms. Spiral-shaped fungi were seen in great number. Bundles and networks of them could easily be recognized. Besides these the microscope revealed some rod-shaped fungi and clusters of nucleated fungus cells. The specimen was exposed to the action of naphtha, and microscopic examination after the lapse of thirty-six (36) hours showed complete cessation of the fungous process. Besides the interruption of microscopic plant-life, there were evident destructive changes in the muscular structure of the specimen, due to the powerful action of the naphtha.

III. A piece of meat, in a state of advanced decomposition, was found to contain numerous forms of fungus vegetations. Some of these were identical with the organisms found in the preceding specimen. Besides these many new forms were seen.

Naphtha interrupts the growth of these fungi immediately. Some of the spiral-shaped organisms continued to grow for days after the exposure to naphtha, but finally there was entire absence of vegetable life in the specimen.

IV. Organic matter, deposited in moist places, which are practically inaccessible to light and air, will in the course of time, be found to be covered with a layer of dust, soot and mould. Under the microscope this layer presents many varieties of plant-life. Many of these fungi multiply with astonishing rapidity and can easily be cultivated upon suitable soil. Their vitality, or resisting power, however, seems to be in inverse ratio to their prolificacy. They are affected by light and atmospheric changes. The action of naphtha is very decided in interrupting their growth and ultimately destroying them.

V. Stagnant water contains many forms of microscopic fungi. Some of these belong to the class of "spirilla," and present many varieties of shape. They are of importance to bacteriological science because specific pathogenic action is attributed to some of them. The best known and most malignant, if left to itself, is the typhoid bacillus. Not being able to obtain a pure culture of this germ, I contented myself with the statement of some German and American observers (among them Hare, of Philadelphia), in regard to the action of naphtha upon the bacillus ty-

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phosus. According to these investigators naphtha is positively antagonistic to the development of this germ, and kills it as readily as does a 100 per cent. solution of bichloride of mercury. As far as other germs contained in stagnant water are concerned, naphtha stops their growth promptly and destroys them, as can readily be seen under the microscope.

From what has been said there can be no doubt that naphtha possesses marked germicidal power. What forms of microscopic fungi are particularly affected by it and how naphtha compares in this respect with other germicidal agents, only careful and systematic experiences can show. But in order to furnish a basis upon which to establish the hygienic value of naphtha in connection with the garbage question, it is not necessary to experiment with pure cultures. I have, therefore, confined myself to the microscopic examination of mixed specimens obtained from garbage, and can, after numerous experiments with mixed specimens and observations of the action of naphtha upon them, answer the question as to the germicidal properties of naphtha in the affirmative.

Experiments all conducted with cold naphtha.

Respectfully submitted.

OTTO JUETTNER, M. D.,
Bacteriologist to Department of Health.

Is Typhoid Fever a Rural Disease?

DANIEL B. D. BEAVER, M. D., OF READING, PA.

In the discussion of this question before a lay audience it may be well to take a retrospective glance at the development of the knowledge regarding it, which is now in the possession of the medical profession.

The first observations which pointed the way to the belief that this disease was due to a material, tangible and visible cause, were made about thirty years ago. There were reported then local eruptions of the disease in small villages in this country and Europe in which the cause was traced to a single well, by observing that all the persons affected by it obtained therefrom their supply of water. Such observations accumulated rapidly, and were made with so much care to exclude error that in a short time the profession was in possession of an array of incontrovertible evidence that impure water is one of the most common sources of the disease. Some years later outbreaks of the disease in cities were traced in like manner to certain dairies by observing that its ravages were confined closely to the routes of particular milkmen, following them in their sinuous courses, striking a family here and there, and then skipping a few houses or as many blocks to turn up with them again.

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By that time there was firmly established the belief that typhoid fever was due to some material cause which was transportable in water and milk, but we had no definite idea of the character of this morbid material until some years thereafter, when the bacteriologist demonstrated it to be a living microbe, a low form of vegetable life which, however, has as distinct, separate and independent existence as a grapevine, and, like it, can be seen, touched and cultivated.

Now, then, believing that the entrance of this living microbe into the human body is the cause of typhoid fever, we are ready to discuss the question as to whether or not this is a rural disease. By a rural disease is meant a disease of which the cause is primarily found more frequently in the rural districts than in cities, and which could not arise in cities if its cause did not pre-exist in the country.

Observations extending over a period of fifteen years have convinced me that typhoid fever is a rural disease.

In an investigation of the comparative frequency of this disease in the city of Reading and the surrounding country during the year 1889, I found the proportion of cases to residents in the city 1 to 246, and in the country 1 to 129, the proportion in the country being nearly double that of the city.

This difference is too great to be due to accidental circumstances. There are permanent conditions which give rise to it, and they are visible to any one who wishes to look for them, and undoubtedly exist in other localities as well as here.

In all the severe endemics of this disease in cities and towns of late years which were investigated, it was shown most conclusively that the poison was imbibed by the victims with their drinking water, and that the water became polluted directly by the discharges from the bowels of persons ill with the disease. In the larger towns and cities this source of infection is altogether absent because the supply of water comes from some outlying district through pipes, thus making it impossible for careless or ignorant residents to contaminate it with the stools of sick persons. The contamination must occur before the water reaches the supply pipes, and in the rural district drained by the streams which furnish it.

Much has been said of late years about bad plumbing as a cause of this disease in cities, and it is questionable whether the plumbers have not been blamed innocently for many cases which, by more thorough investigation, might have been shown to be owing to other causes. In houses connected with a common city sewer there may be some danger of infection from the sewer, but it must be very small unless the grossest negligence is practiced by the occupants, because the pipes connecting buildings with sewers are always moist and therefore in good condition to hold microbes or moulds that may be growing on their surface and prevent them being carried upward with escaping gas

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or air. It is well known, of course, that currents of air of sufficient dryness to desiccate the surface over which they pass will carry along loose bacteria and other small particles of matter, but it is not probable that the moist air of a sewer pipe moves with the velocity necessary to detach moist and adherent growths from its surface. At all events a properly flushed, filled and cleaned bowl in a water closet should be, and probably is, an impassible barrier to the low forms of life in the pipes below it.

In Reading there are no common sewers. The houses with baths and indoor closets discharge their sewage into wells in the yards, which are required to be not less than twenty feet deep.

The surface soil, to a depth of ten to thirty feet, is sandy and porous, carrying off water and solid material in solution so quickly that most cesspools fill very slowly and require to be emptied only once in many years. This being so, there must be many wells in this city which have received and now contain the excretions of persons sick with typhoid fever, and yet the houses connected with these wells by pipes presented less than one-half as much typhoid disease in 1889 as the houses with no indoor closets and baths, and no connection with the cesspools.

Furthermore, a large percentage of the cases which occurred in houses with baths and closets were in recently built houses, of which the diseased persons were the first occupants. The cesspools in these cases could then not be regarded as the source of infection, unless they were shown to be breeding places for such typhoid microbes as might enter them with the outside atmosphere.

It is not improbable that a microbe which attacks the human body only through that part of the intestine in which the contents already possess the characteristics of evacuated fecal matter, might find masses of human excrement suitable to development and multiplication; but then the production of these microbes should be vastly greater in the country than in cities.

Then again, this microbe, unlike the tubercle bacillus, is rarely found in the air and dust in cities, because it is not, like it, cast upon the streets, but thrown underground in wells or sewers, where it is out of reach of currents of dry air.

If, then, the air and water can be excluded from the sources of infection in cities, there remains but one other, and that is the food supply. In regard to this, it may be said in favor of the country, that city and country are dependent upon each other for sustenance, but a moment's reflection will show that they exchange entirely different kinds of food, otherwise there would be no necessity for the exchange.

The articles which are taken from the city to the country are produced, almost without exception, by chemical action, or in their manufacture exposed to degrees of heat that would be fatal to any form of life. On the contrary, the articles which the city receives from the coun-

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try are produced without the aid of destructive heat or chemical action, such as milk, butter, cheese and the vegetables which are eaten uncooked. Most of these articles are contaminated by water in which they, or the utensils in which they are made, are washed; but vegetables may also bear the poison directly from the soil in which they have been grown, especially if the soil has been fertilized by the use of the contents of cesspools. Indeed, Dr. C. M. Cresson, of Philadelphia, whose ability as a microscopist is unquestioned, informs me that he found the typhoid microbe on celery stalks, in the fissures between the leaves. One well-authenticated observation like this should condemn the use of night soil as a fertilizer, and dissuade every intelligent farmer from using it.

Aside from the few instances of direct contamination of vegetables by the soil, water is then the medium through which the typhoid virus is disseminated, whether it enters the body of its victims with food or drink; and the pollution of the water occurs at its fountain in the spring or well on the farm.

Springs are generally located and wells dug in low ground, and the farm buildings arranged conveniently around them. Usually the house and barn are nearest the water, and the other outbuildings and privy some distance away, and almost invariably the latter are on higher ground. The drainage then is from the privy toward the water; and in sandy or shale subsoil, which is very porous, there can be only one result—pollution of the water by the contents of the privy. Now, if a case of typhoid appears on such a farm, what will follow? The fecal discharges of the invalid, which are loaded with fever microbes, more than all the other excretions from his body, are thrown into the privy. The sick one may get well, and the rest of the family escape the disease for the present, ignorant of the fate that awaits them. The poison is already in the cup and need only be taken.

With the next season, or possibly after the next heavy rainfall, one member after another takes the bed, until the whole family have been down with the disease.

This has occurred repeatedly in my experience. I recall now one instance in which every one in a family of nine persons was laid up with the disease.

After communication between a typhoid-infected cesspool and the water-fountain on a farm has been established, there is no telling how long it may be a source of illness. It is possible, as has been already said, that the cesspool may be a breeding-ground for the microbes, and that they may reproduce themselves there for years, or the occupants of the house may change often, so that at short intervals broods of humanized, and possibly more highly vitalized microbes are repeatedly added to the old stock. There are, undoubtedly, many farms in this

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State which send to market crops of typhoid microbes as regularly as butter and cheese.

Several such fever farms were reported to me from this country in 1889, but the one most distinguished in this respect came under my notice some years ago in an adjoining county. While riding with a physician on his way to see a patient, he pointed to a farmhouse which he said had a strange history. He had practiced medicine in the adjacent village thirty years. The farm was occupied by tenants who were changed every few years, and during these thirty years every family that lived on the place passed through this disease. Could the products of this farm have been followed to their destination through this long time, might not terrible tales of woe been unfolded?

How many dwellers in cities, who consumed the products of this farm kitchen, were doomed thereby to an undeserved sickbed and, perhaps, a premature grave?

If the time allotted to this paper would permit it, more facts might be presented in support of the theory that typhoid fever is a rural disease, under the definition I have given; but as the object is to awaken interest in the subject rather than to prove anything conclusively, enough has probably been said. To those who look with favor upon this theory it will be apparent that it behooves us all, whether we are residents of city or country, to bring to the attention of those in authority in the State, and the people in the rural districts, the danger which threatens them and us through the ignorance of the cause and manner of the spread of this formidable disease, on the part of the class who are in charge of the very fountains of our common food and water-supply.

Trichinosis; with Report of Cases.

A Plea for the Obligatory Examination of Meats Under the Supervision of a National Department of Public Health.

By MURRAY GALT MOTTER, A. M., B. S., M. D., LANCASTER, PA.

When, last Tuesday evening, the Hon. S. T. Davis, M. D., an active and efficient member of the State Board of Health, requested me to read a paper before this convention, it occurred to us both, that I could, perhaps, choose no subject of more general and immediate interest than that of trichinosis. Before speaking of an instructive series of cases that engaged the attention of the medical faculty in Lancaster, during the past winter, allow me to dwell, for a moment, upon the history of this disease.

In 1833 Hilton recognized in muscular tissue small, calcified capsules – little envelopes, formed in the sarcolemma or elastic sheath surrounding the muscle fibres—filled with a deposit of lime salt, but he mistook them for cysticerci, to which we will refer later. In 1834 Paget, while a

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student, discovered that these capsules contained a round worm, which was in the following year, named by Owen *Trichina Spiralis*, from the peculiar and characteristic spiral form which the worm was found to assume. Up to this time the source of the parasite was unknown, but in 1846 the late Joseph Leidy, just two years after his graduation from the University of Pennsylvania, and when he was but twenty-three years old, made the discovery which had escaped these eminent investigators on the other side of the ocean. One day, as he was about making a ham sandwich, he noticed a number of small white dots, no bigger than a pin-point, scattered over the meat; these, under the microscope, he discovered to be identical with the trichinæ spirales described by Owen, and which he had frequently seen in his dissections of human muscles. To this discovery, as much as to anything else, was due the expulsion of the "American hog" from Germany. In 1850 Herbst succeeded in raising the larvæ by feeding trichinous meat to dogs. The following year Luschka recognized the finer end of the worm as the head; and, in 1859, the adult worm was studied by Virchow. In 1860 "Leuckart, of Giesen, having the German savants' advantage of a *corpus vile experimentum fieri*, fed trichinous pork to condemned criminals and, by a post-mortem examination, confirmed Leidy's theory." Hitherto the parasite had been looked upon simply as a curiosity; with one exception, all had unanimously considered them innocuous, and some had positively affirmed that they produced no disturbance whatever. Wood, however, had, in 1835, propounded the question whether a case of severe rheumatism, observed by him, might not possibly be connected with the trichinæ found. This terrible misapprehension was rectified by Zeuker, in his study of a single case, admitted to the Dresden Hospital, on January 11, 1860, as a case of typhus.

"The theory of trichinosis had, then, in its essential points reached the following form: Man becomes affected with trichinæ by the use of trichinous pork. The *muscle trichinæ*, in the stomach, become freed from their capsules and developed, in the intestines, to mature, sexual worms, *intestinal trichinæ*, which attain their full growth at the end of about seven days and give birth to living young. These young trichinæ migrate directly from the intestine in which they are situated into the muscles of the same individual; since during their migration they are found in the mesenteric glands, abdominal cavity and pericardium. They penetrate into the interior of the muscular fibres and cause the destruction of the contractile substance; here they grow to perfect *muscle* trichinæ. These migratory processes bring about, in a man, a severe febrile disease—trichnosis—which may result in death, both in man or beast. Cases of encapsulated trichinosis, are to be considered as healed cases of trichinosis." The various steps by which this theory was built up, rests principally upon the investigations of Leuckart, Virchow and Zeuker, who worked independently and in part almost simultaneously upon specimens from Zeuker's case.

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Probably the oldest epidemic known, with more or less certainty, to be authentic, is one which occurred in Wurtemburg, in 1675, in the family of a miserable farmer. The father and his son died; all the remaining inmates of the house who had partaken of the meat were taken ill. A number of epidemics were noted and studied after Hilton's discovery in 1833. Especially interesting was that in Wegleben, near Quedlinburg, in 1849–50, which was subsequently recognized. It was designated at the time as "English Sweat," or "black death." How many trichinæ epidemics were buried under this pseudonym, only a careful study of reports can ever divulge. These reports have come from all over the world; according to an oral report, by Cobbold, trichinosis was diagnosed for the first time in England, in Northumberland, in 1871. So much then for the history of the disease.

The trichina spiralis, one of the class of round worms or nematoda, is met with, as we have seen, under two forms, the intestinal trichina and the muscle trichina. The adult, sexually mature trichina (the intestinal form) is an extremely fine, round, thread-like, slightly coiled worm, with a still finer head, which gradually decreases in thickness towards its point; its hinder extremity is rounded off rather abruptly, the chintinous integument is slightly annulated. The males attain the length of a millimetre and a half, and are furnished at the caudal extremity with two pointless, lobular appendages, and a genital opening which, together with the end of the rectum, forms an outlet directed forwards. The internal sexual organs are already complete even in the muscle-trichinæ. The females are from three to four millimetres long; their genital opening is situated about at the junction of the first and second quarters of the whole length of the body. Only a part of the internal sexual organs of the female are present in the muscle-trichinæ, and a part are formed during its sojourn in the intestine. The embryos of the eggs develop in the uterus and are born from one end of it free—and living. The birth of the embryos begins on the seventh day after the introduction of the muscle-trichinæ into the stomach, and it may continue, as it appears, for weeks. Yet, a repeated maturation of eggs, as it were, in crops seems now and then to occur. The embryos do not long remain in the intestine, but soon migrate to settle in the voluntary muscles. In about fourteen days the muscle-trichinæ attain the greatest size ever reached by the parasite while in that state; they attain a length of from 0.7 to 1.0 millimetres, and they usually lie singly or more rarely in two, three or even four in one capsule. Their digestive canal and the sexual apparatus, although the latter is not yet fully developed, are distinctly visible, as intestinal-trichinæ the intruders have a very limited duration of life. They very rarely live longer than from five to eight weeks. Observations of a longer existence may be explained on the supposition of a repeated importation. The muscle-trichinæ have a much greater tenacity of life; their vitality is almost unlimited and fre-

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quently ends only after the death of the person affected. In some cases they have been found living even after the lapse of decades. After a short time a deposition of lime salts, especially of carbonate of lime, usually takes place in the capsules; this causes it to become cloudy and opaque, and after a time, the trichina is entirely hidden. The capsules then become evident to the naked eye as small white dots or streaks, while previous to the calcification, they were visible only to experienced observers. This condition in pork is to be distinguished from that known as "measly pork," which is due to the presence of the cysticerci of the *tænia solium*, the ordinary, long, intestinal tape-worm, which compared with the *trichina spirallis*, is as the leviathan to the water shark. If then the capsulated muscle-trichinæ be introduced into the stomach of a proper animal, they will be freed from their capsules, become sexually mature within a few (usually two and a half) days, copulate and the females will bring forth living young after five days, *i. e.*, seven days after their importation. In addition to men and swine, the trichina has been found in the cat, rat, mouse, marmot, pole-cat, fox, marten, badger, hedgehog, raccoon and bear. By feeding them experimentally the trichinæ have been successfully bred in rabbits, guinea-pigs, sheep, calves and dogs. In the three latter animals, however, the experiments seem to have been only exceptionally successful. As a rule, the formation of the intestinal trichinæ is the full extent of the infection in dogs.

Trichinosis generally begins with symptoms of more or less gastro-intestinal disorder, such as a sense of pressure and fullness in the epigastrium, impaired appetite, discomfort after eating, nausea or vomiting, eructations, colicky pains and diarrhœa, with a feeling of much languor and depression; in some cases the onset is characterized by violent sickness and purging, simulating cholera or irritant poisoning. Occasionally the disease sets in quite insidiously, with merely a feeling of lassitude and depression, wandering pains and stiffness in the limbs. The subsequent characteristic symptoms are those dependent upon the conditions of the muscles. Those of the limbs which are affected become painful, tender, swollen, hard and rigid; there is much stiffness, movement being greatly impaired, and the joints are fixed in a state of more or less flexion, any attempt to extend them causing severe pain. From the complication of various muscles there may result attacks of severe dyspnœa, aphonia, trismus, dysphagia, impaired movements of the tongue and other symptoms. A peculiar œdema is also observed, affecting the face and eyelids, and extending in the limbs from the upper part towards the hands and feet. Symptomatic pyrexia accompanies this condition, often severe; the temperature sometimes rising to 106° and the pulse to 120 to 140; abundant clammy perspiration may be observed, and occasionally sudamina appear. In cases tending towards a fatal issue, low typhoid symptoms set in, frequently accompanied with

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signs of bronchitis, pneumonia and other inflammatory affections. Should recovery ensue, the muscular symptoms gradually subside, as well as the pyrexia; but convalescence is usually protracted, marked debility, anæmia and œdema remaining for some time. To illustrate this I report a series of cases which occurred in the practice of a brother practitioner, and which I saw with him about the middle of December. On Thanksgiving day, November 26, 1891, Martin K. R. purchased from his butcher a dressed hog, which he and his family immediately proceeded to cut up into sausage-meat, hams, spare-ribs, etc. For several weeks they ate no other meat, but about the first of December Martin and his wife and their eight children became ill. Edna, æt. eight, Stella, æt. twelve, and John, æt. sixteen, went to bed and soon developed alarming symptoms. The correct diagnosis was soon made, and unfortunately was absolutely confirmed by the autopsy, which I made upon the remains of Edna, who died December 20, and whose muscles were found to be simply swarming with living trichinæ. Stella lingered and suffered until February 5, 1892, when she died, as did her little sister, from evident respiratory failure, due to the encroachments of the parasites upon the muscles of respiration. John is on the slow road to recovery. These cases are noteworthy, in that children as a rule escape. These three children presented typical casts of profound infection; the other members of the family and two neighbors, who had partaken of their sausage, were not very seriously affected, though they gave positive signs of a certain degree of infection.

Of all the ills that flesh is heir to, the treatment of few is as hopeless as in trichinosis. The ultimate issue seems to depend almost wholly upon the number of trichinæ ingested; this in turn depends upon the number of trichinæ in the meat used and the amount of the latter and upon the mode of its preparation. The disease is so seldom recognized as such in the early stage, when alone measures looking to the complete evacuation of the digestive tract and the removal of the cause would be of avail. Castor oil or other aperients, glycerine, which, by its peculiar hygroscopic properties, acts directly upon the integument of the worm, and of the newer remedy, thymol, salicylic acid, oil of chabrite and kamala are to be tried. Merrill strongly recommends arsenic. McCalla reports four cases cured by the use of salicylic acid and antipyrin—the latter drug relieving almost immediately the horrible pains. The general treatment must be of a supporting character—quinine and stimulants being also administered. Other symptoms and complications must be treated as they arise. Realizing, then, the difficulties which beset the therapeutic treatment of these cases, which are in such large proportion fatal, it behooves us to turn our attention to the prophylaxis of the disease. In this country our pork is trichinous to the extent of two and a half per cent., while in Germany it is but one-tenth of one per cent. We might, of course, take "Paddy's" advice and when we eat

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pork, eat beef instead! so escaping all possibility of infection, for it is from swine pre-eminently and directly that man is infected with trichinæ. We may remark parenthetically, that there would indeed be danger of "jumping out of the frying-pan into the fire" by substituting tuberculous beef for trichinous pork; then indeed would the "last state of that man be worse than the first!" Next, all can insist, if all must eat pork, upon its having been well pickled and smoked, and, above all, most thoroughly cooked. The pickling and smoking, contrary to some of the older authorities, do not seem sufficient to destroy the parasite, though recent experiments promise some progress in this direction. Of the different methods of cooking, boiling is the most effective, frying and roasting the least so; and the boiling temperature should be maintained, for a length of time sufficient to insure the thorough heating of the interior of the piece of meat in course of preparation. The third, last and most important of all prophylactic measures is:

GOVERNMENT INSPECTION OF MEATS.

It is this part of the paper which especially concerns us as sanitarians and to this question I ask your especial attention. At the opening exercises of the Institute of Hygiene of the University of Pennsylvania, held on the 22d of last month, the "day of the immortal cherry tree," Dr. Benjamin Lee, the able Secretary of our State Board of Health, delivered a noteworthy address. He began with a serio-comic satire on the advantages of life in this "land of the free and home of the brave," as compared with that in the bureaucratic countries of the old world, whose inhabitants groan under the iron heel of despotism. He says: "The tyrannical rulers of those down-trodden peoples actually presume to interfere with their meats and drinks, forbidding them to quench their thirst with water enriched by the sewage of cities, hallowed by the infusion of the remains of their dear ancestors, or delicately tinted with the drainage of coal mines; or to refresh themselves with beer rendered aromatic and enlivening by cocculus indicus and strychnine; or wine manufactured from the juicy apple and the generous turnip, or tea composed of rotten leaves and catechu and colored with verdigris; or coffee innocent of Java and Mocha, or chocolate in which the offensive cocoa butter has been replaced with tallow. They are not permitted to eat the flesh of tuberculous cattle and trichinous swine, while we are freely allowed to feast on those which have been *condemned for their markets!*"

This is an actual fact, our great American Government affords almost absolute indemnity to the foreign consumers of our large pork shipments, while there is no law to prevent the meat, which has been condemned for the export trade, from being turned into our home markets. It is true that this State provides that animals affected by contagious diseases may be quarantined and if necessary, killed, but for our present purpose this law is ineffective and somewhat in the manner of "locking

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the stable after the horse is stolen." To illustrate the thoroughness with which this matter is dealt in Germany, the order of the Minister of the Interior, issued July 21, 1889, regarding the method in which the obligatory examination of pork shall be carried on, for the prevention of trichinosis, contains fourteen sections, concerning the regulation of record-books, character of microscopes to be used, appointment and pay of examiners, etc. The examination of each hog must include six pieces of flesh as follows: (1) from the columns of the diaphragm; (2) from the muscles of the diaphragm; (3) from the lumbar or laryngeal muscles; (4) from the abdominal muscles; (5) from the intercostal muscles; (6) from the tongue muscles. From each of these six pieces of flesh, at least six preparations, must be made, in the form of longitudinal sections, one centimetre long by one-half centimetre broad, and thin enough for investigation. In the examination of ham and sausages, these pieces of flesh are to be taken from different parts, and from each at least four preparations made. The tests of pork and meat should be made in the region of bones and tendons. Each trichina examiner is limited to the examination of ten hogs in one day. The ordinance took effect September 1, 1889. As compared with this, mark the wholly inadequate provisions of the act of our own Congress, approved March 3, 1891. "The inspector will take from each hog *two* samples of muscles, one from the 'pillar of the diaphragm' and the other—from another part of the body!"

The passage of this act, and the subsequent readmission of American pork into Germany was hailed with great delight—more particularly on the part of American pork-packers and shippers.

The French revenue expert sent to inquire into the system of American inspection of pork, publicly states that the system of Secretary Rusk is perfect, and that "it is neither possible nor advantageous for anybody to pack or export a single American hog that has not undergone microscopic examination."

It requires but little consideration of the subject to see wherein our regulations fall far short of our needs. In the first place, the act above referred to, has to do principally with meats intended "for export to foreign countries," and no vessel with such a cargo can be cleared until she shows the certificate of the government inspectors. So far, so good, and if it pleases our friends on the other side of the water, so much the better. There is, then, a provision for the inspector, "prior to their slaughter, of all cattle, sheep and hogs, which are the subjects of interstate commerce, and in addition to the aforesaid inspection, there may be made in all cases when the Secretary of Agriculture may deem it necessary or expedient, under the rules or regulations to be by him prescribed, a post-mortem examination of the carcasses of all cattle, etc., subjects of interstate commerce." That is, I suppose, Secretary Rusk, upon hearing that half a dozen people had died from trichinosis, in Erie or Lancaster, might order an inspection of meat of that city. It is even

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unlawful for John Smith, of Pennsylvania, to sell his trichinous swine to Thomas Jones, of New York; but John Smith, of Erie, may ship all his trichinous meat to William Roberts, of Lancaster, and be paid for the same in the coin of the realm, yea, even in seventy-cent dollars. A number of the largest and wealthiest of the pork packing establishments are now equipped with microscopical laboratories, and microscopists, for the whole of which outfit "Uncle Sam" through "Uncle Jerry," generously foots the bills. Do not misunderstand me as decrying the efforts made on the part of our National Government in any of the lines of scientific investigation. The bare mention of our National Board of Health, short-lived as it was; the names of Sternberg and Shakespeare, whose investigations into yellow fever and cholera reflected credit alike upon themselves, their profession and the government, whose especial commissions they held for the purpose; the record of the Army Medical Library and Museum, and of the Marine Hospital service, and even of the recently organized Department of Agriculture, are all subjects for our congratulation. This is an age of progress and of investigation and education, in evidence of which we are gathered here to take counsel together concerning the sanitary problems which confront us. How, then, may we best take advantage of this *Zeitgeist*, that intangible and at times unrecognized force, which is, according to Bryce, the salvation of "The American Commonwealth." It is needless to speak here of the significance and importance of modern preventive medicine. A single glance at the report of any board of health shows the terrible difference in the mortality lists of those preventable diseases which are still, owing to the ignorance or indifference of the general public, beyond the control of the sanitary scientist, and those which, like small-pox, he has practically eradicated. How shall the general public be lead to know its necessities in this line and to demand their abatement? Last summer, at the forty-second annual meeting of the American Medical Association, a resolution was passed authorizing a committee to memorialize Congress for the establishment of a National Department of Public Health, with a cabinet officer to be known as the Secretary of Public Health. On the 10th of December last, such a bill was introduced by Senator Sherman, and has already engaged the favorable consideration of a number of his colleagues. Referring to the functions of such a cabinet officer, the committee of the American Medical Association said: "He will represent the medical consciousness of the nation, and be one to whom we all can look for the exploitation of measures that will direct continuous scientific and collective investigation, in regard to endemic as well as epidemic diseases that afflict the people. He will be able to co-operate, co-ordinate, unify and utilize, in the discharge of his duty, all the work of state boards of health, now so well organized in various States of the nation; and these in turn will find themselves strongly reinforced by the example and authority of a great central officer who will

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be equal in function and opportunity with the other members of the President's cabinet." He would also have to consider the questions of higher medical education, of the regulation of immigration and many other questions pregnant with the vital interests of our great nation. Can you conceive of a more important measure?

A. W. Suiter, in his address at the eighty-sixth annual meeting of the Medical Society of the State of New York, puts the case even more strongly: "The Fifty-first Congress of the United States has just passed into history. Among the many famous distinctions which it won, was its title to the appellation 'The Billion Dollar Congress.' Think of it, one thousand million dollars appropriated by a single Congress for the material interests of this nation! And in the multitudinous bills which provide for the disbursement of this enormous sum of money not one clause or paragraph appears which can, in any manner, be construed to apply directly to the elucidation of any one of the important and vital problems connected with the prevention of the infectious diseases with which the tax-paying people are constantly menaced or afflicted." Dr. Suiter proposes that there be a Health Department of the Interior, organized on the lines of the old National Board of Health, and the Marine Hospital Service especially, clothed with powers relating to external quarantine. These to act separately or conjointly as circumstances may dictate; both to be officered as may be found necessary, and the officers salaried and even pensioned upon retirement, that they may devote their whole time and energy to the duties of their positions. In connection with the former department, he should have numerous experiment stations established, which should be entirely under government patronage and control, and fully equipped with laboratories—chemical, physical and bacteriological. Some such experiment stations as he describes—though of course not under government control—are already inaugurated; those most recently and thoroughly equipped, perhaps, being in connection with the Departments of Hygiene, in the University of Pennsylvania, at Philadelphia; and the University of Michigan, at Ann Arbor, where every facility is afforded to those interested in this line of work, and especially to public health officers, at the minimum expense. But, the crying need seems to be for some centralized management in order that the best results may be obtained. This we hope to attain in the development of the Department of Public Health, which will have, among other functions, the supervision of the obligatory examination of food stuffs and meats. Referring now, more particularly, to the subject of trichinosis, we have estimated that in a city of the size of Erie the cost of inspection of pork products, which are liable to be infected to the extent of two and a half per cent., need not add a quarter of a cent per pound to the cost to the consumer. This is indeed insignificant when we take into consideration that we can, in this way, and only in this way, secure entire immunity from a horrible disease.

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Methods of Collection, and the Disposal of Waste and Garbage by Cremation.

COL. W. F. MORSE, NEW YORK CITY.

The problem of waste collection and disposal is an ever-present one. The production of waste goes on contemporaneously with life. There

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is no living creature but discards some form of effete or worn out matter, and as the scale ascends from the lowest forms of animal life to man, so the amount of worthless and exhausted material increases with each gradation. And as the result of life is the production of waste, so the accumulation and continued presence of waste mean discomfort, annoyance, nuisance, disease and premature death, for it is certain that substances necessary to the support of the living become, by assimilation, by use, by association even, changed into matters which are deadly poisons to all the higher forms of life.

To the health department of cities and towns is assigned the oversight, often the direct execution of the laws which govern and control the collection and final disposition of this mass of waste. With the health officials lies the responsibility, and from them comes the suggestions, advice and orders which compel the adoption of sanitary methods, the abatement of nuisance, and the regulation of disease dangerous to public health. And so it follows that any phase of this great subject of the public welfare which relates to promoting the com fort even of the people, is something which may not be overlooked by the zealous health official.

It has fallen to my lot to be thrown into contact with a great number of health officers and civil authorities who are interested in the subject of garbage and waste collection and disposition, and the questions asked, the information desired, and the objects sought for, have led me to the conclusion that if the experience of the many could be brought to a common point for comparison the results might afford some hint for future guidance.

The beginning of this question is in the household. How are the waste of the table, the sweepings, the yard refuse, the ashes from fires, put aside to be taken away? Usually altogether in a pile, a box, barrel or an iron can, a mixture of matter which no human power can thereafter separate, or wisely and safely dispose of. The ashes and a large part of that refuse should be put by itself, the worthless and putrescible matter by itself. The one is good for some sorts of work, the other valueless and dangerous, and this separation can only be made at the house, and that with a small amount of trouble.

The collection of waste is done by four different agencies. These are:

First—The Individual System. Every man taking care of his own waste in his own way, with no responsibility for results, with little regard for cleanliness of method, with the only object of getting it away out of sight in the shortest time. A householder hires a cart man and sends away a load a week in winter, mostly ashes; in spring, of all sorts of refuse and cast-off things; in summer, of vegetables and animal leavings from the food supply. The cost is from ten to fifty cents per week, and there is no attention paid by anybody as to what is done

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with the waste. So, annually, the privy vault is cleaned at any price that can be agreed upon, and the duty of that householder is discharged. The results are: First, the payment of at least double the amount it would cost if done under regulation by the town authorities, and second, the promiscuous dumping of all manner of accumulations by an irresponsible cart man at any place where he will not be detected. There are cities of 100,000 people who have no way but this of getting rid of waste.

Second—The License System. Men are licensed to do scavenger work. The city charges an annual small fee, issues a permit and a badge or sign. These men sometimes number two or three hundred, and all make a revenue. Usually a sort of route is established and a certain number of patrons secured, which are fairly well looked after. As a rule the city designates certain places where the garbage shall be put, and has an oversight, through the sanitary police, over the scavengers. While the amounts charged are low, still the sum at the end of the year paid by each householder is more than double what would be paid under the operation of a better system. The advantage is that the scavengers, being known, can be more readily detected in any infringement of the sanitary laws and punished.

Under this license method the removal of night soil is almost universally carried on, no collector being allowed to do work unless he has provided the equipment of tightly sealed barrels, kept clean and inoffensive, the work to be done with prescribed disinfectants and at certain hours, and the excreta conveyed outside the city limits.

The trouble comes with the deposit of this excrement on adjoining lands. Up to a certain point in the winter season the farmers will allow its placing on their land, but presently this is objectionable, the neighbors protest, there is talk of injunction, complaints increase, the collector goes farther away, the thing is repeated until there comes a time when the long haul to place of deposit increases the tax upon the householder, and it becomes a most serious burden. If the money annually paid by the inhabitants for this work was applied to a proper collection and disposal service under municipal regulation, it would only pay the cost but go far toward paying for all the garbage collection as well.

In an eastern city, where this work is done by the city teams and men, the receipts at a very moderate price for each vault cleaned not only paid all expenses, but made a profit of 37 per cent. upon the cost, and paid 34 per cent. of the expense of garbage collection.

In a southern city this work, done by the city, makes a profit of $400 per month, and in another, where no vaults are permitted, the annual expense to each house is $3.00 per year only.

Third—The Contract System of Collection. The city advertises for

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bids, and annually lets out the whole work of garbage service. This is the most convenient way for the authorities to have the work done; but it is also a less efficient way than the municipal system. The contractor is often compelled, by competition, to do the work at a small margin of profit, giving poor service, causing endless complaints and a general feeling of annoyance. Often changing his employes, the householders are overlooked, sometimes intentionally, until a petty system of blackmail is established; and there being but a limited responsibility, because of the usually short term of contract, the contractor, takes little pains to do good work, preferring to skim over his district as quickly as possible.

The experience of a great number of places is not favorable to the contract method, and by comparison in the same place where a part of the work is done by the city, the service of the contractor is inferior to that performed by the city's teams and men. But the contract method is often the only way in which the work can be done, and when in use there should be the most vigilant inspection service maintained.

Fourth—The Municipal System.—In this case the town or city does all the scavenger service with its own teams and men. This makes it necessary to maintain an extensive equipment and to provide for the stables, etc.; but if this be placed under control of the bureau of streets, these men and teams can often be used for other work at special seasons, dividing the expense. The responsibility for cleanly work is more definite, the service more thorough; complaints are promptly attended to; the employes are more careful, and with the proper management, can be made to take pride in their work, and give efficient service.

A trial in several of the large cities of the two methods—contract and city service—has resulted in the recommendation of the municipal system, as the advantages have invariably been shown to be greater.

In a great number of the smaller cities this question of garbage collection and disposal is now under consideration. Up to this time they have ignored the subject, now find themselves compelled to adopt some organized system of collection and a better method of disposal of waste.

A comparative statement of the cost of garbage collection at many places will give a standard by which any city or town desiring to make an improvement can be guided.

Taking the last census as the basis for population, and adopting the per capita method of computation, the following table, while not exactly accurate in all respects, will still show the approximate cost of collecting garbage, reckoned in figures, for each inhabitant.

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The following cities and towns make their garbage collection by contract, the cost named per capita:

		The following use the municipal system:	
Chicago,	24 c.	New York,	21½c.
Philadelphia,	13¼c.	Boston,	22½c.
Washington, D. C.,	10¼c.	Providence,	15½c.
Detroit,	17½c.	Milwaukee,	17½c.
Hartford,	13¼c.	Memphis,	31 c.
Richmond, Va.,	07½c.	Charleston, S. C.,	18½c.
Montreal,	11 c.	Cambridge, Mass.,	25½c.
New Haven,	08½c.	Los Angeles, Cal.,	27½c.
Toledo,	13½c.	Newport, R. I.,	20½c.
Richmond, Ind.,	13½c.	Lynn, Mass.,	12½c.
Portland, Me.,	12½c.	Lawrence, Mass.,	25½c.
Elizabeth, N. J.,	12½c.	Springfield, Mass.,	16½c.
St. Paul,	08½c.	Yonkers, N. Y.,	37½c.
San Antonia,	30½c.	Keokuk, Ia.,	25½c.
Haverhill, Mass.,	09½c.	Norfolk, Va.,	21½c.

Assuming these figures to be approximately correct, the average cost of contract work would be about 14c per capita, and of the municipal service about 22c—a difference of 8c per capita in favor of the contract service.

About 17c per capita may be taken as the cost which will give effective service for any city or town, and be stated as the mean standard for most of the places in this country. This has no reference to the cost of removing night-soil, but applies only to the garbage, ashes and refuse collection, and does not include the cost of equipment, but only the annual expense of removal.

Any method for thorough and satisfactory collection of all garbage, whether done by the contract or by the municipal system, will include some well-defined and simple rules which should be rigidly enforced.

I. An iron garbage can, with tight cover, into which the household puts each day's table offal, tin-cans, house-sweepings, cast-off articles, worthless matter, everything except ashes and non-combustible material. This can is set in a particular place, always ready for the collector. The ashes are separately placed in another receptacle.

II. The collector's cart is preferably of iron, with tight cover; or, if of wood, made water-tight, with a wooden or canvas cover, holding one or two cubic yards, drawn by one horse, arranged to tip up and discharge its load with no loss of time. The garbage collection service is daily in summer, tri-weekly in winter; the ashes collection weekly in summer and tri-weekly in winter, by a separate set of teams and men, and used for city work in filling low grounds or as the foundation for streets. The days of collection, and if possible, the probable hour, are stated on a printed notice posted up in each household.

III. When the collector finds in the cans ashes mixed with garbage, he may refuse to receive it, and, if persisted in, the sanitary officer notifies the party of the penalty, and, if needed, enforces it. Unsually one or two examples are enough to convince any community of the wisdom of obeying the regulations.

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IV. The city being districted, and a sanitary inspector in charge of each, if there are bodies of smaller animals found they are included in the daily garbage collection—the larger animals, if not taken away by those engaged in rendering works, are also removed by the city at the expense of the owner. The carts are cleaned after each load, and kept clean. A daily report from each driver is exacted and a weekly report of the whole made to the health officer. The route of the carts to place of disposal is by the least frequented streets.

V. The work of emptying vaults is done by licensed collectors. They must provide sealed oaken or iron barrels or iron tanks, if possible kept in a covered wagon, the whole equipment to be satisfactory to the health officer, and must be kept clean or the license revoked. The charge for each vault should be fixed and not allowed to be exceeded. As a rule this work is well paid for. The nominal price fixed is almost invariably increased, and by the use of various arts and tricks the collector exacts a sum far greater than the real value of the work done, so that the tax upon the householder becomes a somewhat serious matter.

VI. Contrary to the usual custom, this work is best done in the daytime. The odors are more easily dissipated by the heated air of the day than by the heavy, damp night-air; the work is done with light, and therefore better done; the disinfecting more thoroughly accomplished, and with the proper equipment of barrels or tanks and pumps there is no reason for any nuisance or offense. Of course there are exposed places where it would be unwise, but usually this daylight service will be found best. This is the practice in the Southern States almost universally.

The whole service of garbage collection should be under the immediate supervision and control of the health board. As the control of diseases which may become epidemic belongs to them, as the inspection of water, food and milk supply is done by them, and as this board is held responsible for the sanitary consequences of the good or bad administration of the garbage and dead animals and night-soil collection and final disposal of any place, so they should be granted such power to regulate and administer this department as will render it efficient and satisfactory to the public. Police power should be given the inspectors; the ordinances suggested by the board should have prompt attention; the men and funds for their use should be ample for the work demanded; they should be held to a rigid accountability for a wise, efficient and economical performance of the work, which has been and will always be disagreeable, troublesome, exacting and yet a most necessary part of any communal life.

THE FINAL DISPOSAL OF WASTE AND GARBAGE BY CREMATION.

Whatever may be the method used in the collection of waste from a community, the final disposal of this waste is a matter which compels serious attention.

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The ways now commonly in use for getting rid of waste may be briefly stated:

The mixture garbage, refuse and ashes are dumped upon low grounds or unused lands, within or near to the city limits. The bodies of smaller animals are included, and too often the contents of privy vaults find the same disposition. The results are only too obvious. Endless complaints, nuisance, litigation, contagion and disease come directly from these piles of rotten matter. When completely covered with earth, and to casual appearance sound and solid ground, there is still underneath the hidden cause of disease, prompt to appear when the piles are disturbed, or when chosen as the sites for dwellings.

Again, the waste is to some extent separated, and the putrescible portions taken away as food for swine. If done well and often, it may be possible to use a part for this purpose, but experience in New England has shown the increase in cases of trichinosis to be, in three years, from three to seventeen per cent. among hogs fed with the garbage of the city of Boston, and an annual mortality caused by hog cholera at other places where city garbage is used as food for swine is so great that measures are about to be taken to prohibit the feeding of any city garbage to swine in Massachusetts. How far the milk sold in cities and towns is made unfit for infants, by reason of the food of the cows being mixed with city garbage, is a matter which can only be conjectured, but it seems probable that a large part of the death rate of infants is due to this cause.

The city waste of all sorts is deposited in the nearest water-course. A large city of this State dumps into a narrow creek, running through its bounds, all the sewage, all the garbage and the bodies of small animals. In the summer season, when the water is low, the barrels and boxes which have held garbage and night-soil, and the bulk of tin cans and miscellaneous refuse are so great as to seriously obstruct the scanty flow of water. A few miles below, another large city takes a part of its water supply from the river into which this creek flows. What must be the quality of the water?

Often the garbage, meaning putrescible matters only, is hauled long distances to farming-land, and used for a so-called fertilizer—a doubtful use of time and men. The value of such material for this purpose is almost nothing. By the time it is converted into plant food, by sorting out the imperishable substances and mixing with muck or earth, the cost of the operation, with the low value of the product, has made the expense greater than its worth. One experiment of this sort usually satisfies the most sanguine advocate of the theory of "returning to the soil anything that has been taken from it." The idea is a beautiful one, but its actual realization, by means of the manipulation of crude and miscellaneous city waste, is a practical failure.

The final disposal of the contents of privy vaults, as usually done, is something which demands still more extended and severe examination;

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a matter which is not to the purpose now to discuss, but which may be characterized as filthy, unsanitary, threatening and positively dangerous.

The late advances in sanitary science have brought home to the attention of health officials, and through them to the civil authorities and the general public, the fact that some more sanitary way must be provided for the final disposal of waste; and following this comes the natural inquiry, what better way is there, and what does it cost? Putting aside the plausible theories, and the unpracticable and visionary inventions which by the test of actual trial have proved to be failures, there remain two methods, which in the hands of business men have been brought to the test of continuous work for a period long enough to give data for estimating results.

One is the manufacture of garbage (meaning only putrescible matter) into a commercial product; and the other the destruction of all waste that fire will consume, and the utilization of the ashes for a revenue.

The first method has been used in several of the larger cities for four years past. By means of heat the water and gases of garbage are expelled, and the residue treated by chemicals, which extract the grease, the residuum being used as a basis for the manufacture of a fertilizer. This process is adapted to only one class of the city waste—the vegetable and animal garbage. It does not deal with that large percentage which is included under the term of inorganic waste or refuse, and which in bulk is nearly twenty per cent. of the whole amount produced. Nor does it take any account of the night-soil or contents of vaults, nor, except in a very limited way, of animals. Consequently, the process does not cover the whole field of garbage collection, but limits its work to about fifteen or twenty per cent. of the bulk product; and this must be furnished separately from all other matters.

The works or plant required are large and expensive, the royalties upon the patents costly, and the whole investment beyond the means of any except the larger cities, so that private companies are organized to carry on the work, which require long contracts, at prices usually far above what other systems are willing to guarantee. The operation is attended with risk from fires, because of the materials used, the manufactured product is of variable and very uncertain value, and the operation of the whole investment seems to be hazardous and somewhat doubtful. Of the eight plants erected by the company controlling this process, at different points, at a cost varying from $50,000 to $100,000 each, there are now two only in active use. Two have been given up as unsuccessful; two have been compelled to cease by reason of proceedings at law involving their insanitary operation; one is treating garbage at a cost of $1.80 per ton, which can be destroyed by fire at 75 cents per ton; and the other is run under serious disadvantages which somewhat impair its usefulness.

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There remains to be considered the destruction of garbage, inorganic waste, the bodies of animals and excreta of all kinds by the agency of fire. Assuming that waste is useless, obnoxious, valueless and dangerous, its destruction becomes a question of sanitary and economical performance.

Can it be done without offense and with a reasonable degree of expense? This question can be emphatically answered, yes.

For more than twelve years it has been done in England, at fifty places. For sixteen years the United States Government has destroyed the waste of military posts in a special furnace, and from three to five years' experience of more than thirty different cities and towns in the United States and Canada has proved this statement correct. In this length of time cremation of waste has undergone the severest tests possible, and the results, as reported by disinterested observers, can safely be accepted as conclusive.

The exact description or style of crematory furnace is a matter which each city must decide for itself. There are four now in active use, which have been examined by experts, have stood the trial of consecutive years of work, and which can be depended upon for satisfactory performance. The Mann Furnace is a modification of the English "Destructor," of which one example only is in use at Montreal. The Rider Garbage Furnace, four years in use at Pittsburg and Allegheny City; a furnace at Wheeling, W. Va., using gas as fuel, and in successful operation for some two or more years, and, lastly, the Engle Garbage Cremator, of which there have been some twenty-eight put into use at various places in the last four years, with four more now in process of construction.

To undertake a detailed description of the construction of these furnaces would occupy more time than can be allowed. Each claims certain advantages, and doubtless these claims are well founded; each has its circle of special advocates and ardent partisans, prompt to point out its distinguishing points. For the present purpose it will be sufficient to examine one only, which, by the construction of the largest number, seems to be more generally accepted as capable of the widest range of service.

THE ENGLE GARBAGE CREMATOR

may be briefly described as a rectangular brick structure, forty feet long, ten feet wide and twelve feet high. At one end a stack of iron or a brick chimney seventy-five feet high, over the furnace an iron covering house with sliding doors, and at the sides, a little above the top of the furnace, wide platforms with ample driveways and approaches. From the platforms iron slopes lead down to the feed holes in the top of the furnace. These are five in number, one being large enough to receive the carcass of a horse. The collection carts dump their loads directly upon the slopes, no further handling being needed. The garbage, as

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it falls through the feed-holes, is caught by grate bars, extending across the interior half way from top to bottom. The liquid passes through these bars and is retained in a shallow concave pan or hearth below the bars. The capacity of the largest furnace is about twenty cubic yards of garbage and fifteen barrels of liquid at one charge. At each end of the furnace, on a level with the garbage grates, are fire boxes, and at the stack end are flues into the chimney, closed by heavy fire-clay slabs. The interior walls are lined with heavy fire-clay blocks, accurately fitted together, backed on the outside by a solid brick wall, braced and bonded together with heavy stays, rods and angle irons. The furnace being charged, the fires are lighted first at the front and afterward at the rear end, the flames from the fire passing over and through the mass of garbage piled on the grates, driving the smoke and gases into and across the second or front fire, where they are consumed. The flames from the second fire are, by the action of the strong draught, brought back underneath the garbage grates, intensely heating the garbage from the under side. When liquids are to be destroyed, a part of this heat and flame is directed under the hearth or pan, and all the contents quickly evaporated and burned. All the odors, gases, and product of combustion are passed through one or the other of the fires, there being no escape except across these fire boxes. The ashes, as they fall through the grates, are raked out of a lower range of doors on the side, and from time to time, as required, the garbage is stirred up and distributed over the grates by bars thrust through an upper range of stoke doors.

The action of the furnace is continuous, and has been carried on for six months together without cessation. Usually the whole garbage collection, including the bodies of animals of whatever size, is daily destroyed, and at night the night-soil is consumed. When large quantities of night-soil are to be consumed it requires a specially constructed furnace to dispose of the liquids, but when the quantity is small it is burned in the garbage cremator, with no interruption of the operation in destroying garbage.

The body of a horse is consumed in an hour, a dog in six minutes, and a cubic yard of garbage may be destroyed in ten or fifteen minutes, or less, if containing small amounts of liquid.

The cost of operation depends mainly upon the quality and cost of fuel. Under ordinary conditions, with the labor of three men, and a good quality of fuel, seventy-five yards of garbage and miscellaneous refuse (equivalent to thirty tons) can be destroyed at a cost of ten to eighteen cents per yard. This may be stated as equivalent to thirty to fifty cents per ton.

The latest furnaces, built at Savannah, Ga., destroy 3,000 cubic feet of miscellaneous garbage with 128 cubic feet of pine wood. On a week's run 21,000 cubic feet of material is destroyed. This is a pile of refuse matter $\frac{2}{3}$ of a mile long, three feet high and three feet wide, burned to

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ashes in seven days' time with seven cords of wood. The average cost for the last month was twelve cents per cubic yard for fuel used and labor employed, equivalent to about thirty cents per ton.

The ashes of garbage, and especially animal matter, have a positive value. Chemical analyses at the Agricultural Experiment Stations show that they contain from 5 per cent. to 12 per cent. of potash and phosphoric acid, being nearly equal to Canada wood-ash of the same bulk. The practical application of the ashes to land by farmers shows the value to be even more than is claimed. Under favorable conditions the value of these ashes should defray the cost of the fuel used in combustion.

There are four sizes of the Engle cremators, adapted to places from 2,000 to 30,000 population. When cities of the largest size adopt this method, two or more furnaces are built at different locations to save transportation of garbage. The cost of the cremators is governed by the varying conditions of locality, cost of material, labor, transportation, the kind of structure demanded by the special situation, etc., etc., but may be said to be extremely moderate in amount when compared with the large sums necessary to build works for other methods of disposal.

The sanitary performance of these cremators is beyond question. By reason of the location within the city limits, near to the collection field, the operation must necessarily be entirely sanitary, without smoke or odor, and creating no nuisance. In all the places where these cremators have been tried, and where managed as directed by the printed instructions of the Engle Company, there has never been any complaint lodged with the company from any unsanitary or offensive conditions created by the furnace. This may appear to be a strong statement, but is fully borne out by the facts, and the testimony on file from health officers and city authorities is very convincing upon this point.

The work done by the Engle cremators may be easily summed up. There have been twenty-eight garbage cremating furnaces constructed at twenty separate towns and cities, ranging in locality from the tropics to the extreme north of this country, and from the Atlantic to the Rocky Mountains. Of this number three have been replaced by larger constructions of the same kind; and in two places only has the use of the cremator been discontinued, and this from no cause connected with the furnace, but from other reasons.

The United States Government has adopted this form of cremator at two of the military posts, and the city of New York has found an Engle furnace indispensable in destroying, in the heart of the city, without offense, with no chance for the escape of disease germs, infected articles from persons sick with contagious diseases, as well as the waste of hospitals.

Finally, this method of disposing of the waste of cities and towns has been proved, by long-continued use here and abroad, to be moderate in

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first cost for the plant, to be strong, durable and convenient in construction, to be able to destroy every class of city waste that fire will affect, to do this with speed, with freedom from nuisance, annoyance, with marked economy in fuel and labor, with some resulting product of value, and with the certainty of relieving the community, the authorities and the health department from the continual presence and menace of this most perplexing, annoying and dangerous waste.

It would seem reasonable to suppose that any city or town, where the disposal of garbage gives trouble or creates unsanitary conditions, might avail itself of this method of solving a problem which is not easy to deal with in any other way than by total destruction of the cause of the difficulty.

An Epidemic of Faith-Cure.

By HON. SAMUEL T. DAVIS, M. D., OF LANCASTER, MEMBER OF THE STATE BOARD OF HEALTH OF PENNSYLVANIA.

The title by which this paper is announced may sound ambiguous, but I expect to show it to be appropriate and even exact, in view of the facts that called it forth.

I do not expect to prove to you that the form of hallucination mentioned has, or will, become epidemic—common sense forbids that. But I do propose to demonstrate the relation of cause and effect, *a priori* and *a posteriori*, between the faith-cure delusion and the extension and high death-rate of contagious and infectious diseases.

It is not necessary or even proper to attack or defend the position that some honest people and more knaves are so fond of assuming, that those who have not the required sort of faith are disqualified as critics.

Grant that for the sake of peace; it remains true that each must act upon such wisdom as he possesses—walk by the light of his own lamp—and as in this question the wisest men of the entire historic period have been and are in accord, the majority rule will apply here for all the purposes of this discussion. Nor is it any more necessary to assert or deny the possibility or occurrence of miracles. Whatever may have been the fact in the past, miracles as against law do not occur in our days since all the asserted examples fail before even ill-conducted investigation. The right of religious belief or unbelief is justly sacred. However irrational my views may seem to my neighbor he is bound to treat them with at least formal respect so long, and so long only, as they do not lead me to infringe upon his or others rights. We concede right here that there are honest, sincere men and women who believe—more's the pity—that literally and exclusively "the prayer of faith shall save the sick," and that consequently the physician is an unnecessary evil. It is these more than any class who have called forth this attempt to meet the real question in the case.

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As for the knavish charlatans who encourage this delusion for their own profit there can be but one opinion among sane people—their place is in the penitentiary, supporting themselves by hard labor by some honest handicraft. No intelligent man, especially a medical man, fails to recognize the importance, the value, the necessity in a certain class of cases of resorting to mental impressions as a means of relief. There is no difficulty either in comprehending how this may come to pass even if the process is obscure. But the line between this and the assumptions of the faith cure illusionists is broadly laid down.

Human reason, human judgment are of course superfluous, even as adjuncts to the direct operation of the Supreme Will, and as "faith moves the arm that moves the world," of course given the faith, no more is needed; indeed, any other remedial interference is impertinent presumption. Their logic would be all right if their premises were sound, but "there's the rub."

Now the educated class who, after all, dominate the whole public and shape the future of society ought to be far enough advanced to agree to one proposition which, once admitted, I think decides this question. Here it is: The supreme test of any theory is its outcome in practice under average conditions. If a thing won't work on a fair trial it wants mending; if mended and still fails it falls. Just here we part company with the literary advocates of faith-cure or Christian Science, as their bright lights choose to term it. They say: "We care nothing about given cases or any or all cases; we do not know all the conditions; we have God's promise, on that we rest." And we could afford to let them rest and the subject also if it affected none but themselves, for their folly would die with them, but we have a duty to our fellow-men—first, as members of the same human family, then as parties to the social compact, and last and above all, those of us who have the obligation of teachers of medical and sanitary science and conservators of the public health.

"To the law and the testimony," what are we offered in support of the theory? A case here and there of a nervous invalid whose enfeebled intellect, will power and bed-ridden body, roused by some sudden stimulus, has enabled him, or more frequently her, to rise up and walk. I will not insult your intelligence and good sense with the cases of fractured bones united in an instant, or dislocated joints, or the reconstruction of absent lungs, livers, spleens and other organs of the human economy, as these are merely evidences that Ananias and Sapphira had a large family before their final misfortune, and their characteristics have been perpetuated to this day.

Where are the evidences of positive arrest or mitigation of epidemics without proper sanitary measures? And when the greatest of modern investigators made a fair proposal that a special ward in some hospital be made the object of united prayer to test whether, under the same

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conditions, any difference would be observed, why did it receive a unanimous negative, and even innuendoes as to its motive? On the other hand how many and how sad are the results of trusting to spiritual (so-called) remedies for physical evils! Their name is legion, and each of us could contribute one or more. But sometimes the facts take a shape that not only furnishes evidence but demands action, and such a case I have now to relate. I ask indulgence for suppressing names and precise locality; these proceedings are public and no good would be done by particularity; the facts are well in hand and will be furnished to any investigator. It is to be hoped that some of the persons concerned were transparently honest in their delusion, and some of them have not been enlightened even by the terrible consequences I am about to narrate. Their persistence in the face of such a calamitous sequence of events is, perhaps, the gravest feature of the case, and the one which is the best justification for taking your time for its consideration. The cold and unvarnished facts I obtained from a medical gentleman in the neighborhood as well as several of the most prominent citizens. In a certain school district within a few miles of the city of Lancaster, Pa., with a population of 35,000, a number of well-to-do and influential families hold "faith-cure" opinions. A case of diphtheria occurring in one of these houses, no physician being employed, the other children were allowed to attend school some ten days until the sick child was supposed to be dying, when the other children were kept at home to see her die. The next case was in a family living one-fourth of a mile from the first, the children attending the same school. Five cases occurred here, but as a physician was called at once only one died. Next two children of a brother of the first family took the disease. No physician and both died. Next a cousin's family of three children were stricken down. No physician and two deaths. Next the toll-gate keeper's three children, first a little boy. No physician; died. Then a sister of the dead boy; no physician; recovered. A brother of the last two children, living away from home, came to see the little boy before he died; he wanted to kiss him, did so, and in a few days the visitor took ill and died; no physician called until a few hours before his death.

There were in all thirty cases in the neighborhood attended by physicians, seven of them dying, and eight cases treated by "faith-cure," six of them dying. All these cases were within a radius of about two miles; all the children of school age attending the same school; the teacher belonging to the faith-cure clique, and a sister of one family afflicted and cousin of two others. She visited freely during the epidemic, and permitted the children of the first family to attend school after its appearance at home. When the school board were informed of the facts she was required to discontinue her visits and exclude children of affected families. Meanwhile, the families of the clique, sick and well, interchanged visits, met for prayer; public funerals were held for the

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diphtheria victims; and though the bodies were not taken into the church, friends and relatives assembled at the houses of mourning to eat together, as is the custom in the country. While attending a case in the house where the first two cases occurred, my informant learned that not even simple household remedies were permitted, such as greasing the throat and neck, teas, etc.

In God's name, is it possible in this enlightened age, that we must be called upon to record such acts of cruel negligence, and within the confines of the Commonwealth of Pennsylvania! Here is a neighborhood invaded by a destroying scourge; no attempt made to arrest it; no fundamental law to protect the helpless innocents! The school a center of infection, and every means of spreading it in full operation—public funerals, free visitation, no isolation of cases, no human means used. What results could follow but those recorded? Families dismembered; lives sacrificed; homes desolated; helpless children deprived even of paternal ministration. It is with the utmost difficulty that one can hold himself down, even in cold black and white, to permissible expression of contempt for the folly, and indignation for the presumption of those who are responsible for such events. We seem to hear the blood of neglected innocence crying from the silent tomb for vengeance—not on their deluded parents and friends, for whom we ought, perhaps, rather feel compassion, but for the knaves and charlatans who stand behind them, and the country which does not protect their young lives from the fell destroyer when possible to do so. I must not omit stating that these believers in "faith-cure," who meet weekly in one another's houses for prayer and consultation, have several among them who have been to New York for instruction, which is given free, but a "voluntary fee" is accepted and, no doubt, expected.

I cannot trust myself to comment further on this subject. The practical question is one of duty. What are we going to do about it? If we, as physicians and sanitarians, have any duties to the public, it would seem we need look no further for one of them. It is only justice to the State Board of Health to recall that for the last seven years, or since the Board was established, we have been knocking at the deaf ear doors of the Legislature, with our hands on our mouths and our mouths in the dust, praying and imploring it to give us authority to organize local boards of health in every school district in the State. Our supplications have received the cold shoulder, and hundreds of lives are being yearly sacrificed through contagious diseases in the several districts which might be averted. In view of such facts as those narrated, every one of us should be inspired with new zeal to create a healthy public sentiment that will demand and secure proper legislation for the protection of the first object in search of by the framers of our constitution—life—without which "liberty and the pursuit of happiness" don't count.

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What is the most practical method? A friend, with whom I discussed this matter, coolly remarked: "Well, the refusal of tested and approved means of relief in sickness is suicide; we can't punish that, and it is a good riddance of fools. But the denial of such means to others, especially to helpless children, is murder, and should be punished as such." The logic is sound, and many of us are ready to say amen to its conclusion; but public enlightenment and public conscience are far behind that standard, and we must deal with things as we find them. What is the present scope of practical legislation? Several things, the more important of which I briefly note:

(1) All cases of contagious disease to be reported to constituted sanitary authorities, and enforced by penalty.

(2) Compulsory isolation of contagious diseases.

(3) Prohibition of public funerals in contagious diseases—enforced by penalty.

(4) Exclusion of children of infected families from schools and public gatherings--enforced by penalty.

(5) Application of the laws governing the practice of medicine to the so-called teachers and practitioners of healing the sick by faith-cure, Christian science, or whatever name they may assume.

There is nothing in this that should call out objection from any one, and when I proceed to dispose of objections that will be made, it is not for your instruction but to complete the subject as addressed to the public. I make no apology for radical measures, having been long ago satisfied that no others avail in dealing with serious evils.

We shall hear much of interference with "personal liberty," "constitutional privilege," "religious rights," and so on. Fortunately the highest authority has covered a large portion of this ground in dealing with another question. The Mormons, of Utah, raised a definite issue of religious privilege against national law, and the highest tribunal decided it upon ground broad enough for the purpose here proposed. So I have only to add: What is a government good for, that cannot, or will not prevent the diffusion of deadly poison among its defenseless subjects? Why may I forbid my neighbor to dump garbage before my door if he may send his children to carry diphtheria or scarlet fever into the school among my little ones? The questions answer themselves; the Supreme Court has covered them, and I can afford to leave them right here.

But we are told that such legislation, if at all practicable, will be inquisitorial, expensive, and therefore unpopular and short lived. Inquisitorial, perhaps—there is such a thing as too much freedom of some individuals in all communities, which means oppression to the mass, and a little inquisition in our case would have prevented far greater evil. Socialism is undeniably right in holding that what is needed for all must be conceded by each. Expensive? Somewhat, no doubt. But

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how much more expensive the neglect? Will the objector estimate the cost of the young lives sacrificed in the faith-cure epidemic I have described, and then count the few dollars for proper sanitary protection? Unpopular? That is a question of fact. A generation ago the free school system was fought on the same ground; this year the State gives five millions. The evolutionists stand on impregnable ground when they compare the facts of past and present. When Abraham made his son carry up the hill the wood with which he proposed to burn the boy's murdered body, "his faith was counted to him for righteousness," but it was in an age when the people around him sacrificed their first-born to idols. A few years ago a Massachusetts fanatic sacrificed his little daughter for the same asserted reason, viz: Divine command, and his faith was counted *him* for a residence in the penitentiary, escaping the halter from doubt of his sanity. By this time let us hope Pennsylvania is ready, at the coming session of the Legislature, to follow that worthy example by adopting measures to prevent and punish all forms of child murder, whether arising from cruelty or superstition. Short-lived? Never believe it. Give us competent sanitary laws for a few years, and an intelligent Governor would protect us from repeal; and the people once feeling its benefits, would bury any man offering to interfere with it so deep that his contaminating influence would never be able to appear above the surface.

My justification for taxing your patience so long is found in my own appreciation of the grave importance of the subject, and I hope it may be fully discussed, and its main objects may find place in your Committee on legislation.

Microscopic Examination of Water from Public Water Supply of Erie, with Remarks Thereon.

DAVID N. DENNIS, M. D., OF ERIE, PA.

From the published title of my subject I fear you will expect from me some lengthy and accurate microscopical and biological analysis of the city water. I do not profess to be an expert in this line, and only wish to give some points for discussion and put forward a theory. Is our water good or bad? Twelve years ago it was excellent.

Some two years ago a member of my household contracted typhoid fever. For my own satisfaction and the safety of my family, I took a specimen of water from the hydrant in the kitchen, placed it in a bottle that had been washed with a solution of bichloride of mercury, and then thoroughly washed with boiling water. This was filled with the city water, sealed and sent to Philadelphia for examination. The chemist and biologist who examined the specimen is a gentleman with whom I am personally acquainted, and one whose word I can thoroughly trust.

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After the examination he sent me a letter, of which the following is an extract:

"The water received from you is in very bad condition (underscored) and, moreover, contains recent cesspool drainage. I am of the opinion that it is well water and carries the dejecta from typhoid sickness. Please advise me as to the facts, location and surroundings."

Shortly after this, possibly a month, the water commissioners of this city sent a number of sealed packages of water taken from the bay and from private wells for analysis. The specimens were sent to the same chemist who examined my specimen. After making the examination the report thereof was sent back when, strange to say, the bay water was free from sewerage matter and germs. The well water was polluted in nearly every instance, and in some numerous typhoid germs were found.

The theory which I wish to put forward to explain this seeming difference in the examination is this: The specimen sent by me was taken after a severe wind storm. The water was very oily and filled with sediment. The specimens sent by the commissioners were taken from the bay when the water was clear. The inference is that the sewerage contained excretions from a score or more of typhoid and dysentery cases which would empty into the bay from the several main sewer pipes. This would, as a matter of fact, precipitate if the water was calm and an exceedingly small percentage float away, as there is very little current in the bay. During a storm the water, as you know, is very rough and the waves run high. The sewerage which had precipitated and the sewerage which was being emptied during the disturbance would now be churned and thoroughly mixed with the water. Thus, should a specimen be taken at that time it would show all the germs that were being emptied into it. This, I think will explain the seeming difference in the examinations.

The question of the advisability of emptying the sewerage into the bay I think can scarcely be argued. When a pumping station is situated a few hundred yards away from the main sewer I doubt if any one would try to argue that it was wholesome, much less pleasant to contemplate. As the city increases in population the evil, of course, will increase as the water in the bay will, in time, get to a point nearing saturation, when the sewerage matter will not precipitate as thoroughly as it does now, and when a quantity of free matter will be directly pumped up and served throughout the city with the water supply. If the water is taken from the bay the sewerage should be emptied into the lake or disposed of in some other way; or better still, the city water supply taken directly from the lake, where there is no chance of contamination, and the bay receive the sewerage.

If this paper succeeds in drawing out the ideas and opinions of the gentlemen present who are versed in these matters, and if the inhabi-

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tants of the city can thereby gain pure and more wholesome water, it will have served its purpose.

TYPHOID FEVER AND IMPURE MILK.

LEWIS H. TAYLOR, M. D., *of Wilkes-Barre, Pa.*

Among the different causes of enteric fever, the use of infected milk has long been known to play an important part, and from time to time, in the course of epidemics, cases have appeared whose existence could not be explained on any other hypothesis than that the patients had used milk contaminated with the germs of the disease. A few local outbreaks have been reported in which the source of the disease in nearly all of the cases seemed to be found in the milk supply, but such instances have been rare, and when an extensive epidemic of typhoid is reported, we are generally quite apt to find polluted water playing an important part in its causation. So apt is this to be the case that any inquiry into the cause of a fever outbreak would not be regarded as complete until a thorough inspection of the water supply had been made.

When, however, such investigation shows the chief general cause to be free from suspicion, we naturally turn to the second most frequent cause, and investigate the milk supply of our patients. A history of the epidemic I am about to relate will, I trust, be of sufficient interest to be its own excuse for presenting this paper to your meeting to-day.

Early in the month of October, 1891, a number of cases of typhoid fever appeared in the borough of Nanticoke, most of them in the upper or best portion, from a sanitary point of view, of the town. New cases appeared from time to time through October and November and into December, but it was not until the epidemic had almost ended that the attention of the State Board of Health was called to the matter, with the request that the same be investigated.

I received instructions from the Secretary of the Board December 25, 1891, to investigate the outbreak, and report thereon as soon as possible. I began my investigations the next day (December 26), after receiving the order, and on December 28, addressed the following letter to each of the physicians of Nanticoke, asking a series of questions bearing upon the disease in their midst:

"WILKES-BARRE, PA., *December 28, 1891.*

"MY DEAR DOCTOR: Will you kindly give me, on behalf of the State Board of Health, at your earliest convenience, the following information concerning the prevalence of typhoid fever in Nanticoke:

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"First. Have you treated any cases of typhoid fever in Nanticoke since October 1, 1891? If so, how many?

"Second. Please give name, age, sex, residence, date of attack, and result of treatment of each.

"Third. Will you please state what water supply was used by each; whether the public supply or well water? Also the milk supply of each? From whom obtained? Were any of your patients in the habit of boiling their drinking water before using?

"Fourth. What method of disinfecting stools was used, if any?

"Fifth. Was the house connected with sewers? If not, in what way was refuse disposed of?

"Sixth. What is the general sanitary condition of the neighborhood in which the cases occurred?

"Seventh. Did you attend any cases of typhoid in Nanticoke prior to October 1?

"I will consider it a personal favor if you will reply to this at your very earliest convenience. Any other information you may be able to give on this subject will be gladly received.

Very truly yours,

"LEWIS H. TAYLOR."

From the replies received, I found that Nanticoke had been remarkably free from typhoid fever for a long time previous to October of the year just closed. The first case appeared September 27, and the next after that, October 2. From that time to December 11, there appeared, as shown by the reports of the physicians, forty-nine cases. Dr. Meck also reported having treated a number of "typho-malarial" fever, but none that he could call typhoid.

As stated in the beginning of this paper, whenever an epidemic, limited or extended, of typhoid fever occurs, we first ask the question, "What water did the patients drink?" and if this seems above suspicion, the next question that naturally arises in our minds is, "What was the source of their milk supply?"

Of the forty-nine patients reported, seven used well-water, and forty-two used the public supply taken from Harvey's Creek (See Table 1). Of the seven who used well-water, one contracted the disease away from Nanticoke, one was among the early cases in Nanticoke, and the remaining five, judging from dates of their attack alone, would clearly be classed as secondary cases, due no doubt, to contaminated well-water. Whence came the infection of the remaining forty-two cases? Why not from drinking polluted water from the public supply? I find upon investigation that Nanticoke, formerly supplied, as villages usually are, by wells, was for a time largely supplied with water pumped directly from the Susquehanna river, but since 1886, the year following the Plymouth epidemic, the supply has been taken from Harvey's Creek, the outlet of Harvey's Lake, the largest body of water in the State of Pennsylvania.

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This stream flows, in the main, through a sparsely settled country, a large portion of which is mountainous and wild. Early in January, in company with Mr. Moseley, superintendent of the Water Company, and Dr. S. L. Holly, of Nanticoke, I followed the stream five miles up from its mouth toward its source. It is a stream estimated to have an average daily flow of 12,000,000 gallons, and in its present state has evidently much above that figure. The reservoir or intake of the water company is situated about two miles from Nanticoke, on the opposite side of the Susquehanna river, and from this point the water is piped to and across the river to the pumping station of the company. Here it enters a receptacle, or well, twelve feet deep by fifteen in diameter, in such manner as to allow all heavy sediment to settle to the bottom. The overflow from this, passes into a second well, and a current of several inches from the top of well No. 1 into well No. 2, and on out into the waste water-way, carries off any light, floating material, such as leaves, sticks, etc., that may possibly have passed through the screens and into the pipes at the reservoir. From the top of well No. 2 the water is pumped through a fine wire screen at the rate of two to two and one-half million gallons a day, up the hill and into a standpipe five feet in diameter and fifty-four feet high. From this it is distributed to the town. The arrangements at the pumping station are most excellent. A constant stream of running water, abundant in quantity, and apparently excellent in quality, is kept passing through the wells before entering the pumps. The wells are cleaned on an average once a month, and any accumulated sediment thoroughly blown out. This, of course, does not necessarily exclude the water from being factor in producing typhoid fever, though it does secure a water supply free from any gross impurities. There are reasons, however, which to my mind exclude the public water supply from a share in causing the present epidemic.

First.—I followed the stream for three miles above the reservoir and examined the location of closets, etc., in reference to contamination from cesspool drainage. For a long distance the stream flows through a narrow valley with precipitous wooded hills on either side, and without any houses or chance for the same near its banks. The first house encountered was at Schooley's saw-mill, about a mile above the dam. Here the closet was probably 200 feet from the stream and not in a dangerous location. A half mile further up we found, in the neighborhood of Frisbee's mill, six or seven houses, but in all but one, the closets are at a safe distance from the stream. The exception is located fully forty feet away and is of such a character that no contamination at present need be feared from it. (Its owner promised to use all due diligence to keep it disinfected and offered to move it if we thought it dangerous.)

The next houses encountered were at Ceasetown, three miles above the reservoir. Here there are ten and at all of them, strange to say, but

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one, the closets are at a safe distance from the creek. The exception is at quite a distance from the main stream, but is situated right over a little tributary in such a manner that its refuse is constantly washed away into Harvey's Creek. The owner promised to remove it at once. Inquiry showed that there had been no typhoid fever in any of these houses along the stream, nor, as far as could be learned, had there been any cases farther up the valley. I did not follow the creek farther than Ceasetown, but learned from the inhabitants that the houses farther up were very few, and in general are situated back from the stream. Inquiry of the physicians who practice along the valley, did not reveal the presence of any cases of typhoid anywhere along the stream, hence I concluded that in the absence of any positive evidence of contamination, we may at least infer that the water was reasonably pure.

Second.—The large volume of water in the stream at all seasons of the year, and the long distance it flows through sparsely settled country before entering the water company's pipes, would render it a reasonable safe source of supply.

Third.—I find on the western side of the Susquehanna river, viz., at Avondale, Grand Tunnel and the upper part of West Nanticoke, from 100 to 150 families supplied with water from Harvey's creek and none of them had typhoid fever during the time of the Nanticoke outbreak.

Fourth.—The borough of Nanticoke has from nine to ten thousand people who are supplied with water from Harvey's creek. If the water were at fault, we would reasonably expect the cases of fever to appear all over the town instead of in a limited portion, and especially would we expect all that portion lying along Main street and still lower toward the river, which would naturally receive water from the dead or less active portions of the water pipes, to be affected equally with that portion of the town situated on the hill; such was not the case.

For the above reasons I think we may reasonably conclude that the public water supply did not cause the typhoid fever of the past few months.

We turn to the second question and ask: "What was the milk supply of these patients affected with the fever?"

Of the remaining forty-two patients who used hydrant water, we find that thirty-one used wholly or in part the milk supplied by a farmer living three miles above Nanticoke, and there is good reason for believing that many others drank also from the same milk. There is situated in the neighborhood where many of the cases occurred a prosperous drug store, where milk-shake was dispensed during the summer and fall as a popular beverage, and the milk for the same was furnished by the same farmer who supplied the majority of the typhoid fever patients. Several of the local retailers also were in the habit of purchasing milk from the same farm for a portion of their supply.

In the accompanying table I have classified all of the cases reported to me by the physicians of Nanticoke.

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TABLE I.—TYPHOID CASES IN NANTICOKE, IN 1891.

No. in order of attack.	Age.	Sex.	Residence.	Date of attack.	Result.	Water supply.	Milk supply.	Method of disinfecting.	Disposal of excreta.	Sanitary surroundings.	
1	35	F.	Green St.,	Oct. 7,	Died.	Hydrant,	Mr. T. and Mrs. B.,	Brom chlor.,	Privy,	Bad.	
2	10	M.	Broad St.,	2,	Recov.,	do.	Mrs. B.,	Carbolic acid,	Buried.	Good.	
3	20	M.	Noble St.,	4,	do.	do.		Chlo. lime,	Privy,	Fair.	Disease contracted at Winton, Pa.
4	20	M.	Church St.,	4,	do.	do.	Mr. O.,	do.	do.	do.	
5	15	M.	Green St.,	10,	do.	do.	Own cow,	do.	do.	do.	
6	15	M.	Green St.,	10,	do.	do.	Mr. T.,	do.	do.	do.	
7	8	M.	Prospect St.,	11,	do.	do.	Mr. T.,	Lime and fe. sulph.,	Buried,	Good.	
8	14	F.	Green St.,	11,	do.	do.		do.	do.	do.	
9	17	M.	State St.,	12,	do.	do.	Mr. T.,	Carb. acid,	do.	do.	
10	35	M.	Green St.,	12.	do.	do.	Mr. T.,	Br. chloralum,	Privy,	Bad,	
11	17	M.	Church St.,	12,	do.	Well.	Mr. T.,	None,	do.	do.	
12	14	F.	Green St.,	13,	do.	Hydrant,	Mr. M.,	do.	do.	do.	From Mr. T. occasionally.
13	24	M.	Church St.,	13,	do.	do.	Mr. W.,	Lime & sulph. iron,	Buried,	Good.	Drank T. milk also.
14	14	M.	Green St.,	14,	do.	do.	Mr. J.,	do.	do.	do.	do.
15	21	F.	State St.,	14,	Died.	do.	Condensed milk,	Br. chlor.,	Privy,	Bad.	
16	36	M.	Broad St.,	14,	Recov.,	do.	Mr. T.,	do.	do.	do.	
17	8	M.	Green St.,	15,	do.	do.	Mr. T.,	do.	do.	do.	
18	40	M.	Noble St.,	17,	do.	do.	Mr. S.,	Ch. lime.	do.	Good.	Father of No. 3.
19	51	M.	Main St.,	25,	Died,	Well,	Own cow,	Sulph. iron,	Buried	do.	Cont. disease at Winton, Pa.
20	33	F.	Broad St.,	26,	Recov.,	Hydrant,	Mr. T. and Mrs.,	None,	do.	Bad.	Part of time Mr. T.
21	20	F.	State St.,	Nov. 2,	Died,	do.	Mr. T. and B.,	Carb. acid.	do.	Good.	
22	2	M.	Church St.,	7,	do.	Well.	Own cow,	Br. chlor.,	Privy,	Bad.	
23	19	F.	State St.,	5,	Recov.,	Hydrant,	Mr. T.,	Sulph. iron,	do.	Good.	
24	23	F.	Green St.,	9,	do.	do.	Mr. T.,	Br. chlor.	do.	Bad.	Milk also from Mr. M.
25	22	F.	State St.,	8,	Died.	do.	Mr. T.,	Carbolic acid,	Buried,	Good,	
26	33	M.	Honey Pot.,	15,	Recov.,	Well.	Neighbor,	Chlor. lime,	Privy,	Fair.	
27	12	F.		15,	do.	Hydrant,	Own cow,	do.	do.	Fair.	Niece of No. 8, and visited his house frequently during his illness.
28	30	F.	Main St.,	15,	do.	do.	Mr. D. and T.,	Br. chlor.,	do.	Good.	Sup. and part by Mr. T.
29	6	M.	Church St.,	27,	do.	Well.	Own cow,	None,	Buried,	do.	
30	20	F.	Broad St.,	28,	do.	Hydrant,	Mr. T.,	Sulph. iron,	Privy,	do.	
31	30	F.	Church St.,	30,	do.	Well.	Own cow,	Br. chlor.,	Buried.	do.	
32	24	M.	State St.,	30,	do.	Hydrant,	Mr. T.,	do.	do.	do.	
33	4	M.	Church St.,	Dec. 2,	do.	do.	Mr. T.,	do.	do.	do.	
34	6	M.	Market St.,	1,	do.	do.	Neighbor,	Chlor. lime,	Privy.	Fair.	
35	17	M.	Prospect St.,	1,	do.	do.	Mr. T.,	Lime, etc.,	do.	Good.	
36	2	M.	Green St.,	2,	do.	do.		do.	do.	do.	
37	25	M.	R. R. St.,	6,	do.	do.	Mr. T.,	Sulph. iron,	do.	do.	
38	51	F.	Green St.,	8,	do.	do.	Mr. T.,	do.	do.	do.	
39	32	F.	Green St.,	8,	do.	do.	Neighbor,	do.	do.	do.	

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TABLE I.—TYPHOID CASES IN NANTICOKE, IN 1891.—*Continued.*

No. in order of Attack.	Age.	Sex.	Residence.	Date of attack.	Result.	Water supply.	Milk supply.	Method of disinfecting.	Disposal of excreta.	Sanitary surroundings.	
40	6	F.	State St. . . .	Dec. 8. . . .	Recov. .	Hydrant,	Mr. T.	Chlor. lime, ...	Privy, ...	Fair.	
41	31	F.	State St. . . .	11, . . .	do. . .	do.	Mr. B.	Lime, ...	Buried, ...	Good	
42	20	F.	. . . . .	Since Oct. 1,	do. . .	do.	Mr. T.	Chlor. lime, ...	Buried or privy	do.	
43	20	M.	. . . . .	do.	Died, . .	do.	Mr. T.	do.	do.	do.	
44	5	M.	. . . . .	do.	Recov. .	do.	Mr. T.	do.	do.	do.	
45	17	M	. . . . .	do.	do. . .	do.	Mr. T.	do.	do.	do.	
46	19	F.	. . . . .	do.	Died, . .	do.	Mr. T.	do.	do.	do.	
47	28	F.	. . . . .	do.	Recov. .	do.	Mr. T.	do.	do.	do.	
48	13	F.	. . . . .	do.	Died, . .	do.	Mr. T.	do.	do.	do.	
49	. .	M.	. . . . .	do.	Recov. .	do.	Mr. T.	do.	do.	do.	

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In analyzing these cases as tabulated, we find, first of all, that Nos. 3 and 19 contracted the fever at Winton, Pa, and came home to Nanticoke sick with the disease. Hence, in a consideration of the causes of the epidemic in Nanticoke, these two should be ruled out of the list.

No. 18 was father of one of these cases, and came down with the fever thirteen days after his son began. He might possibly be classed among the secondary cases from carelessness in management, though the physician had instructed the family to use chloride of lime as disinfectant.

No. 27 was a niece of this family and frequently visited them during their illness. If the above four be omitted, we have left forty-five cases to be considered; of these twenty-seven were supplied with milk from the above-mentioned farm directly.

Of the remaining eighteen, Nos. 12, 13 and 14 drank milk also occasionally from the same farm.

Two Polish children, Nos. 8 and 36, are reported as, source of milk unknown. It is very difficult for the physician to ascertain all of the facts from some of the foreign population who do not speak any English, as they cannot understand the meaning of the questions, nor the necessity of correct answers in any investigation.

This leaves twelve who are reported as having milk from their own cows, from neighbors or from dealers other than the one above mentioned. Of these, six used well-water instead of the public supply, and four of them are cases in which the origin of the infection may be clearly traced.

Edward C. (No. 11) was clerk in a drug store, where milk-shake was used freely as a beverage. He drank of this milk, which was supplied by the farmer mentioned, and was taken with fever Oct. 12. He lived with his sister, in whose family Nos. 22, 29, 30 and 31 were attacked respectively Nov. 7, 27, 30, and December 2; clearly cases of secondary infection from infected well-water from the introduction into the house of case No. 11. The physician in attendance says the water was gotten from an old well five or six feet deep, just back of the house and in a location to catch all the drainage from the surface under and around the house. In this case excreta were thrown on the surface and in privy vault, and no disinfectant was used until the patient had been ill for some days. If these four should be regarded as secondarily, due to this farmer's milk, it would make thirty-five out of forty-three cases, or over 80 per cent., probably due directly or indirectly to the use of this milk.

As to the remaining cases, who are reported as procuring milk of different dealers, it can by no means be asserted that they did not drink of the same, for many people were in the habit of drinking milk at the drug store above mentioned, and may thus have used it without being reported.

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An interesting incident is found in the family of Dr. D., who procured his milk from a different dealer. In the hot summer and autumn evenings he frequently went over to a local retailer and purchased a quart of milk as an additional supply. This was drunk before going to bed. His wife was taken ill with typhoid fever, and his mother-in-law, who was staying with them for a time, was also taken ill, went to her home in another town and died of typhoid fever. Inquiry revealed the fact that the milk purchased from the local retailer came from the suspected farm. While it is impossible to say with absolute certainty that the epidemic was caused by milk supplied from this farm, yet the fact that so large a portion of the cases used this milk is sufficient to cast considerable suspicion on the milk supply, and warrant an investigation of the same.

Accordingly, accompanied by Dr. S. L. Holly, of Nanticoke, I visited the place mentioned, had an interview with the owner, looked over his premises carefully and procured a sample of the water from his well, which I forwarded by Adams Express to Dr. Leffmann for examination.

I found that Mr. T. kept a dairy of thirteen cows, from which he supplied milk to his customers in the borough of Nanticoke, and that he was the milkman supposed by many to have distributed typhoid fever among certain residents of the place. Two years ago a passing drove of cattle halted at his place and pastured on his farm about a week. In about two weeks after his own cows began to be ill and his whole herd of thirteen died in a short time. This was investigated by the State Board of Agriculture and the disease pronounced Texas fever.

Mr. T. has lived in his present location seven years and his family has had no serious illness in that time until October of 1891. He was taken sick himself October 4, at the same time the outbreak began in Nanticoke and was ill with typhoid fever for seven weeks. His son, aged 5, was also taken sick, October 4, and ill for four weeks. L. S., aged 15, relative in the same house, was taken sick October 7, and was ill for three weeks. Mrs. T., his wife, was taken sick October 11, ill for three weeks. C. S., aged 20, a relative who came to the house about one week after Mr. T.'s illness began, was taken sick November 26, and was still in bed, though convalescing at the time of the investigation. These all had well-marked typhoid fever.

Mr. T. and family, with others, have used the water from his well constantly until taken ill and then the sick ones were supplied with water carried from a spring some distance away. Mr. T. does not know of any typhoid fever occurring previously in this house and thinks there has been none for twenty-five years, though I afterwards learned from Dr. Dodson, of Nanticoke, that he had taught the neighboring school ten years, and had had typhoid fever from using water of this well and that others in the neighborhood had the disease at that time. The other end of the farm-house is occupied by another family who use the water

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from the same well. At the time of the investigation three of this family were ill, but their attending physician did not pronounce the disease *typhoid fever*. The first of these, G. K., aged 29, was taken ill on Thanksgiving day, had headache, nosebleed and diarrhœa. He was ill three or four weeks, was then up about four days and is now down again.

Mrs. E. K. was taken ill November 28, with "inflammatory cold;" sick two weeks; up three or four days and then "took cold and relapse with pneumonia." (?) She is now quite well, very dull and sluggish, sordes on teeth, dry tongue, etc. These used the well-water until illness began and since then have used spring-water. In a house a few yards away a family of three lived, and also used water from this well. None of them were reported as having typhoid. A daughter, aged 20, died, October 12, 1891; said to have died of heart disease.

The pupils of a public school, situated a short distance above this farm, were supplied with drinking water during the day from the well up to the outbreak of the fever, but, so far as known, none of them contracted the disease.

This local outbreak is of great interest of itself, aside from any influence it may or may not have had on the spread of the disease in Nanticoke, and the query naturally arises, what was the source of this infection? Mr. T. states that none of his family had been away from home for some time, except himself. He had been in Beach Haven about September 1 and stayed two nights, but did not know of any typhoid fever being there at the time. He sold milk in Nanticoke daily, and drank freely of the water. His wife, who contracted the disease within a week of himself, had not been away at all nor had his child. The other two, L. S. and C. S., came from Berwick to the farm and contracted the disease sometime after their arrival. Thus far the origin is obscure. A huckster from Beach Haven frequently passed through this neighborhood and stopped with Mr. T. He was there and spent a night about September 1 and again about September 15. At the time of the latter visit he was complaining of headache, general aching, lassitude, etc. He went directly home; was immediately taken down with typhoid fever and was ill four weeks. It is quite possible that he was commencing with the disease at the time of his visit and if so, this would serve as the parent case at the farm, the subsequent ones developing early in October.

After the patients had been ill for a short time a nurse was procured, and the stools disinfected, but previously they had been thrown into the privy, which is situated below the well so far as surface is concerned, and on ground sloping toward the river, and away from the house and well.

The privy is situated forty-five feet from the rear of the house and one hundred and twenty feet from the well, the ground sloping toward the privy, so that it is considerable below the top of the well. Remarkable circumstances for a house in the country.

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Appearances would indicate that the privy would not pollute the well. The later is twenty-four feet deep and Mr. T. assures me that he ascertained when draining the well that the water came into it from the opposite side to the privy—*i. e.*, from toward the barn.

A few hundred yards from this well, and on considerably higher ground, is a large cemetery, which is used much more than country cemeteries generally are. It is located in a populous valley and many of its lots are owned by families who have moved into the adjoining towns, but still bury their dead in the old cemetery. There is a shallow gully or depression in the ground between the farm-house and the cemetery, the ground sloping toward it from either side; but the well, although higher than the gully, is still much lower than the cemetery. The accompanying crude diagram will show the location of the various places mentioned.

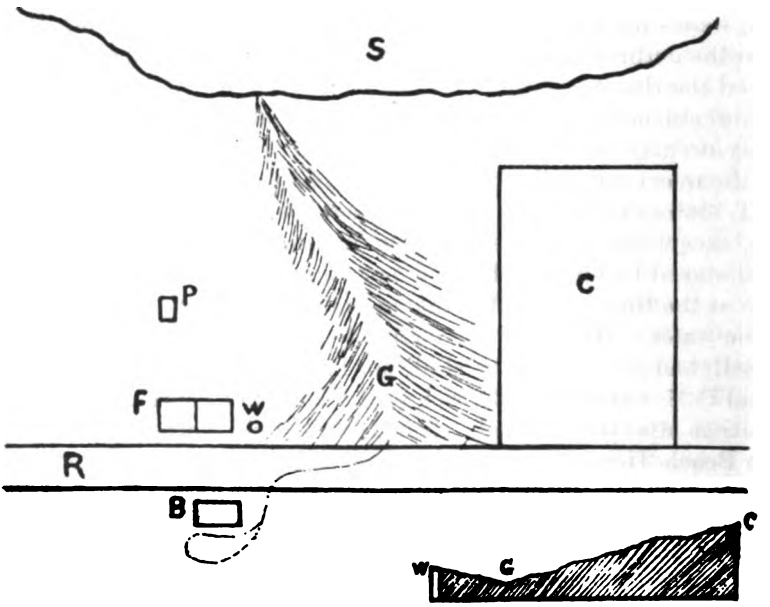

Diagram of slope from cemetery to well.

F. Farm house with two families.
P. Privy, used in common.
W. Well.
B. Barn, the drainage from which is across the road, and eventually in the gully, G.
R. Public road between Wilkes-Barre and Nanticoke.
S. Susquehanna river.
C. Cemetery.

The distance from the cemetery to the gully is 357 feet, and from the gully to the well is 230 feet. Over in the cemetery, where the sexton was digging a grave at the time of our visit, the slope of rock was found

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to be toward the farm-house, and subsequent investigation by digging near the well showed that the same dip continued on the opposite side of the ravine—*i. e.*, toward the well.

The sexton, who has lived within the cemetery grounds for three years, does not know of any recent burials from typhoid fever, except in the mouth of December last. Of course, it is impossible to say that the well is polluted by the cemetery. We have always thought that burial was one of the safest means of disposal of typhoid-germs; but who can tell how far such may be carried underground when circumstances favor their distribution? Certain it is that this well was contaminated in some way from the fact that so many who drank of its water were affected with typhoid fever. The following report from Dr. Leffmann offers additional confirmation of this suspicion:

"BENJ. LEE, M. D., *Secretary of State Board of Health of Pennsylvania:*

DEAR SIR: "The following are the results of an examination of a sample of water sent by Dr. L. H. Taylor, Wilkes-Barre, Pa., marked 'T——'s well:'"

Chlorine,	50.40
Nitrogen as nitrates,	12.60
Nitrogen as nitrites,	none
Nitrogen as ammonium,	0.005
Nitrogen by permanganate,	0.080

Clear and colorless.

"The above results correspond with those usually obtained in the examination of well-waters in populated districts, in which the subsoil water is largely polluted by infiltration of foul matters, but in which the soil is still capable of oxodizing the organic material to the final point—*i. e.*, nitrates. The high figure for the nitrates and chlorides, the low figure for the organic matters and ammonium compounds and the entire absence of nitrites indicate these conditions. Notwithstanding the fact that the ingredients in this water are not positively injurious, I regard it as unsafe for drinking purpose, because of the evidences of previous contamination, which may become at any time too great to be properly removed by the soil action. In addition, the introduction of specific contamination, such as the bacillus typhosus, is liable to occur and distribute the disease among those using the water. All figures in the analysis are in parts per million.

"Yours,

(Signed) HENRY LEFFMANN."

The water from this well was used by the family without suspicion up to the time of the illness, and also used for washing and cooling the cans which supplied the milk to customers in Nanticoke. When we take into consideration the fact that so many cases of fever were found among families supplied with milk from this farm, that many cases were

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found at the farm itself about the same time, and that the water of the well was in unsatisfactory condition even so late as January 1, I think we may safely say, that suspicion strongly points to the milk used, as the cause of the outbreak in Nanticoke.

Such was the opinion held by all of the physicians of Nanticoke with whom I conversed on the subject. The following is an extract from a letter received from Dr. D. H. Davis, under date of January 7, 1892. After detailing his case, he further says: "With the exception of G., all of these cases occurred in the southern or hill-portion of the town, where the sanitary conditions are as good as possible, consistent with the absence of sewers. It is the opinion of the local physicians, myself included, that the epidemic is largely due to the milk supplied by Mr. T. While an analysis of my own cases will not justify such an assumption, the history of the aggregate of the cases, with reference to this point will, I think, do so. Furthermore, it is known that T. has furnished other dealers with milk from his own supply. Among the cases which occurred in town were those of two boys, P. and B., who were employed in a cigar store beneath my office, and whom I almost daily saw, go to T.'s wagon and drink their fill of milk. They were attacked almost simultaneously with the appearance of the disease in T.'s own family. I did not attend any cases of typhoid fever during the past summer previous to October 1, and six cases will include all the instances in which I have treated the disease or known of its existence in the town since the introduction of the public water supply (probably six years) prior to the 1st of October. I know of but one case having occurred in Grand Tunnel, a boy who had been abroad previous to his attack. This fact, I think, militates against the assumption that the water supply was responsible for the appearance of the disease."

Inquiry of physicians and others show that, while the borough is by no means in an ideal sanitary state, yet its general sanitary condition is as good as can be expected without sewers, and was as good in the year just passed as in previous years.

Upon inquiry as to the ice supply, I found that it was furnished by two dealers, who obtained it partly from the Susquehanna river, partly from the Glen Lyon reservoir and partly from a pond filled by the Nanticoke Water Company. Inasmuch as the supply of ice was general and the epidemic local, it seems impossible that it should have figured in the causation of the disease.

In the absence of any other discoverable cause, in the presence of the fact that typhoid-fever was prevalent in Mr. T.'s own family and that it appeared in so many families of his customers, his well was condemned, and the family ordered to discontinue the use of this water for drinking purposes and for washing milk-cans unless it be previously boiled.

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Notes on the Sanitary Condition and Necessities of Pittsburg.

CROSBY GRAY, CHIEF CLERK, DEPARTMENT OF PUBLIC SAFETY, PITTSBURG, PA.

Upon no other single factor does so much of the material prosperity of a community depend as its hygienic condition. It may in all other respects highly commend itself, but if from any cause its sick or death rate be excessive, it will be carefully avoided and shunned.

The natural elements which are necessary to make up a healthy locality are pure air, pure water, a pure soil, and pure food. These were all originally bestowed in abundant measure by the Creator, but as populations increased, and especially as people congregated in cities and towns, the natural conditions were changed, and in consequence the sick and death rates were proportionately affected, as the changes were great or small.

The first three natural and essential elements mentioned, are so closely allied, or depend so greately upon each other, that they may be classed in the same category, and viewed and treated from the same standpoint. Thus, pollution of the soil involves contamination of the air and water; contamination of the water involves that of the air and soil; while that of the air involves, to a greater or less degree, the others.

The necessity for action looking toward the prevention or amelioration of these conditions was early recognized, and measures were adopted for the preservation of the essential elements in their original purity, so far as possible. One of the earliest enactments of this character was of directly divine origin, delivered through the medium of the "great lawgiver," to the Israelites.

In modern times, and especially during the past quarter of a century, the conservation of the public health has largely engaged the attention of the public mind. Numberless investigations have been made by sanitary scientists; hundreds of volumes and essays have been written by many of the most profound thinkers and brightest minds of the age; and thousands of addresses and lectures have been delivered by eloquent orators in furtherance of this laudable purpose. The laborious and painstaking efforts and thoroughly scientific researches of such practical investigators as Pasteur, Koch, Klein, Sternberg and others have created a renewed and increased interest in the subject, and marked a new and important era in its history.

The discovery and development of the fact that many, if not all diseases, and particularly those classed as zymotic or infectious, are due to the presence of specific germs or micro-organisms, which have their origin in, or are propagated by a contaminated and unwholesome condition existing in the essential elements before referred to, has opened a new and fertile field for investigation, and rendered many of the former theories and methods of sanitation comparatively valueless.

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Do the abnormal and dangerous conditions referred to prevail or exist in the city of Pittsburg?

A careful study and analysis of the reports issued by the bureau of health during several years past show that while the general mortality of this city compares favorably with that of most others, yet that resulting from acute infectious diseases, embracing diphtheria, scarlet fever and typhoid fever, is considerably higher than that exhibited in many other and probably less favorably situated cities, when considered by the standard of natural advantages, and originally healthy site and surroundings.

The average annual death rate from acute infectious diseases during the past eighteen years has been about 21 per cent. of the total. Of this amount 14 per cent. was due to diphtheria, typhoid fever and scarlet fever, which prevailed in the order named.

That the peculiar conditions necessary to the causation or propagation of these diseases exist to some extent, at least, and in certain localities, is evident. Typhoid fever and diphtheria for a number of years prevailed to an almost alarming extent in the district locally known as the "South Side," embracing that portion of the city lying south of the Monongahela and Ohio rivers, and comprising the 24th to the 36th wards inclusive.

Several investigations made, seemed to point conclusively to a contaminated public and private water supply; a polluted soil resulting in part from those abominable relics of the past, privy-wells, defective plumbing and sewerage, lack of thorough isolation of the sick, and disenfection of premises and surroundings, as the most probable and effective agents in the causation of these diseases.

Within the past four years, however, both of these diseases have changed their *habitat* from the South Side to the East End district. The reasons for their forsaking the former district may not be quite perceptible, as at least some of the direct or predisposing causes continue to exist, although at present they appear to be in a sort of quiescent condition, but are ready, with a little encouragement, to again assert themselves. One of the most probable reasons, however, for the recent immunity from these diseases in the district referred to, is the improved and extended system of sewerage which has been inaugurated within the past few years.

Most of the causes for the existence of the diseases referred to on the South Side may also be found in the new and later scene of their activity, viz: The East End district. This district includes the better residence portion of the city, and is composed of the 13th to the 23d wards inclusive. Imperfect drainage and sewerage, and the use of the old style privy-well, both of which insure pollution of the air and soil, are the producing causes in some sections, while in others a contaminated water-supply is doubtless the reason for their existence. The im-

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pure water-supply referred to is that obtained from wells and springs, the use of which is resorted to during the season of freshets in the river from which the public supply is obtained, and which is thus rendered unpalatable, while that obtained from the wells is regarded as greatly preferable on account of its being clear and cold, although it most likely is charged with the poisonous leachings from the surface, old and leaking drains, and the ubiquitous privy-well. The use of water from springs and wells is also compulsory in portions of this district, which are sparsely settled, on account of the entire absence of a public supply.

The subject of better drainage and sewerage for this district has received quite an impetus during the past few years, and it is hoped and believed that, with the completion of the extensive system contemplated and now in course of construction, the hygienic condition of the district will be greatly improved.

What of the fourth essential element necessary to good health, viz., pure food? It cannot be doubted that Pittsburg, in common with most other communities, suffers from the use of unwholesome and adulterated food. Avarice provides the product, or material, while ignorance, poverty, and a mistaken economy furnishes the market therefor. It is to be regretted that this subject has not engaged the public mind to the extent which its importance demands. It is with pleasure we note the fact, however, that this question was considered by the Legislature at its recent session, and that it is likely to be again at the next one, when it is hoped that some effective legislation will be enacted which will insure a proper remedy.

In this connection it may be remarked that the enactment of a law a few years since, prohibiting the manufacture and sale in this Commonwealth of "oleomargarine," one of, if not the least harmful of any of the adulterations of, or substitutes for pure and natural food, was unwise and unjust, however honest the motives which induced its adoption may have been. Oleomargarine is a valuable food stuff. While probably not equal to the best grade of butter, it is certainly much superior to the poor and rancid butter which is generally sold in our cities. One of the greatest dietary needs of the workingman is a sufficient supply of an inexpensive, wholesome fat. This necessity could be largely met by the use of this artificial butter.

As somewhat analogous and incidental to this question, the repeal of the law providing for the appointment of sealers of weights and measures in the several counties of this Commonwealth, might be referred to. That the citizens of this State are being daily defrauded to the amount of thousands of dollars, by unscrupulous and avaricious dealers in the necessaries of life, and especially food supplies, on account of the lack of this wholesome check, is evident, or can be made so, to the careful observer. It is to be hoped that both these enactments will be

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speedily repealed in the interest of good health, as well as honesty and good morals.

Having thus briefly, and probably in a very unsatisfactory manner set forth the insanitary conditions which exists in some portions of Pittsburg, let us as briefly refer to a few of the sanitary necessities which should be considered and acted upon in order to insure to that community an improved condition of health.

The *first* necessity is a pure water-supply. This can be secured to the districts which now suffer for lack of it, by the extension of the city system, which thus far has succeeded in furnishing at least a comparatively good potable water. The experiment of sinking artesian wells, has recently been tested in one section of the South Side District, and proved to be successful, an excellent quality of water having been obtained at a depth somewhat exceeding 100 feet. This, if carried out to a conclusion, would doubtless do much toward solving the problem in that district.

The *second* necessity is the abandonment, by compulsory means, if necessary, of the use of water-wells, at least in the more densely populated sections. While it may be true that the water obtained from all of these, and at all times, is not unfit for drinking purposes, yet the fact remains that none of them are, like Cæsar's wife, "above suspicion." The risk of contracting disease through this medium is too great and frequent to be longer tolerated.

Third. The further extension of an improved sewerage system in the East End and South Side Districts especially. This would, of course, be attended with considerable outlay of money, but if viewed from a financial standpoint alone, it should be born in mind that the average cash value of a human life, as computed by competent authority, is about thirteen hundred dollars, which amount, if multiplied by the number of lives which could be saved to the community, saying nothing of the value of the thousands of days lost by the attendant sickness, would, in a surprisingly short time, pay the entire cost of an elaborate system of sewerage and drainage for the entire city.

Fourth. Better methods of construction and inspection of plumbing and house drainage. There is probably greater danger, to health and life, from faulty plumbing and imperfect trapping and ventilation, than from almost any other source. This is due, in a great measure, to the employment of incompetent or careless workmen, and the use of inferior material. The use of material below the best grades should be prohibited. Persons engaged in this important branch of sanitary work should be required to undergo an examination at the hands of competent authority, and only those who satisfactorily pass said examination should be permitted to perform such work. Then the inspection of plans, work and material should be rigid, and embrace every detail. This inspection should include not only new work and material, but old

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as well. The employment of a single inspector, as at present, falls far short of the necessities of the case.

Fifth.—The abandonment of the old privy-well wherever it is possible to connect with sewers. This should also be made compulsory, and should not only involve their disuse, but the prompt removal of the contents, together with that of the contaminated soil surrounding it for a diameter and depth co-extensive with the pollution, and the filling of the excavation thus made, with pure earth, and the application of disinfectants. Where sewer connections cannot be made, the dry-earth closet might be used to advantage in many cases. In lieu of this, shallow wells should be constructed, not more than eight feet in depth and of a convenient diameter. These should be lined with hard burned brick, laid in cement, and both inside and outside surfaces thoroughly cemented. The contents should be removed frequently, and by means of a pump or other similar inoffensive appliance.

Sixth.—A better system and method of collection and disposal of waste material, garbage and offal. At present the collection of this material is a matter of private enterprise, conducted in a sort of slipshod manner by means of appliances crude and unsuited for the purpose, and at least in some instances by irresponsible parties. Some of it is delivered at the single garbage furnace owned and operated by the city, while the balance and larger portion is deposited in the rivers, on vacant lots, or other not less objectionable places.

It should be collected and removed daily during the heated term, and three times per week during the balance of the year, either under contract between the city and proper persons and paid for by general taxation, or by the municipality itself, it owning the teams and apparatus. The removal should be made by means of properly sealed iron tanks, mounted on two or four wheels. Additional furnaces should be erected, or other proper means and appliances provided at convenient points, where it could be promptly disposed of in an inoffensive manner.

Seventh.—More thorough and scientific inspection of the food supply. That unwholesome and adulterated food plays an important part in the causation or propagation of disease, at least by means of an impaired vitality resulting from its use, there can be no doubt. The means of detection should be at all times at hand, and the punishment swift and sure. To do this, the aid of the chemist and microscopist are indispensable. The methods now in use in Pittsburg fall far short of the ideal and necessary means to accomplish the end in view. On account of a lack of funds for securing the proper appliances, and the employment of fitting talent for the prosecution of this important work, the inspection of food has been confined to a few commonplace articles of every day use, and conducted in a very superficial manner. The employment of one meat and milk inspector and an inspector of vegetables, is the

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sum total of the protection from imposition of this character afforded a city of more than a quarter million of inhabitants.

Eighth.—More complete isolation of those suffering from infectious diseases. The law now existing and applicable to the sanitary care and treatment of small-pox should be made applicable to diphtheria and scarlet fever. Houses in which these diseases exist should be placarded and guarded, so as to prevent any chance of the intermingling of the community outside, with those inside the infected premises or family. These precautions should also be required of those residing in the same family or house in which the disease exists. If need be, the inmates should be fed and clothed at the public expense until all danger of infection has passed away. It will be found much more economical to do so, when it is considered that while small-pox, which is so much dreaded, and yet so easily prevented, kills only scores, and at long intervals, the diseases mentioned are ever present with us, and count their victims by the thousand.

Ninth.—Proper sanitary regulations governing the care and burial of the bodies of victims of infectious disease. The tender ties of relationship and sympathy for the sick are sundered by death, and should thenceforth be wholly extended to, and manifested for the living. In furtherance of this object, the body should be at once thoroughly disinfected and placed in the casket, which should be securely closed and not again opened, unless special permission be granted by the health authorities. The funeral should be strictly private, and attended only by the immediate relatives, none of whom should be children.

Finally.—Thorough and scientific disinfection of persons, clothing, houses and surroundings should be practiced. The methods of disinfection now in use are antiquated, and their application quite too superficial. They are relics of the time when the substitution of one odor for another was regarded as the *ne plus ultra* of disinfection. As previously referred to, the development of the germ theory has entirely revolutionized this branch of sanitation. Many of the former agents used for this purpose, and popularly supposed to be of great benefit, have, in the light of recent discovery, and practical tests, been found to be quite valueless, at least as germicides.

Wynter Blyth, Medical Officer of Health for Marylebone, in a paper published in the London *Medical Times and Gazette*, in 1884, thus treats the subject: "Rampant rides the quack in the fields both of preventive and remedial art. Quackery takes a well-known common powder, labels it with a grand mystic name, selling bright copper at the price of gold. Qackery finds a stink outstinking feebler stinks, and gives it forth as a disinfectant. Of all the substances gathered together under the name of disinfectants—solids, vapors, gases and odors—a small percentage alone possess any value."

This opinion may sound harsh, and appear to be too radical and sweeping, but the result of recent investigations goes to prove that it applies

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to very many of the so-called disinfectants with which the sanitary market is flooded.

A few of these, as well as many of the well-known and recognized chemical agents, or combinations of agents, have proven to be of value. In order to insure their success, however, they should be intelligently applied. Besides, some of the most effective agents are of a character dangerous to health and life if handled and used by persons ignorant of the fact, or unfamiliar with the proper method of application. For this reason, as well as to insure the best results, the use of disinfectants should be under the direct supervision and control of the sanitary authorities. A disinfecting corps, composed of intelligent and reliable persons familiar with the subject, should be organized and thoroughly equipped with all the modern and necessary appliances and materials, and placed in charge of each and every house or premises where found necessary.

The most effective in the list of disinfective agents is fire, which should be applied in all cases possible when infected bedding, clothing and similar material is involved. In most instances it is impracticable to carry out this method, when its application is left to the option of the persons interested, and also on account of lack of proper facilities for the purpose. The health authorities should be supplied with a proper plant for the destruction of such material, which destruction should in all cases be conducted by them. This plant could be conveniently erected upon property already owned by the city, and at a comparatively small expense.

The next best method for the disinfection of such material is by subjecting it to a high degree of dry or moist heat. This also cannot be satisfactorily accomplished by private parties, for the same reasons as those mentioned in connection with disinfection by fire. Suitable appliances for this purpose should be provided at the public expense, and operated by the health authorities. These could also be located upon property already owned by the city.

Further consideration of "disinfection and disinfectants," being such a long, wide and deep subject, I am compelled to forego, and intrust it to others abler and more competent. While it has been ably and intelligently discussed and investigated by the American Public Health Association, our own very efficient State Board of Health, as well as many other scientific bodies and individuals, yet it being a subject so exceedingly important, and so little understood by the general public, I trust that it may find a place in the list of questions to be considered by this convention.

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On the Sewer System of Erie, Pa., and the Indispensable Improvements Needed Therein.

BY GEORGE PLATT, CITY ENGINEER, ERIE, PA.

Sanitary science is of modern growth as we understand it. The subject has only engaged the attention of scientific men for the previous forty or fifty years, and it has been discovered that the greatest enemy to man's comfort, if not his health, was man himself; and the best method for the prompt removal of noxious refuse from the vicinity of his dwelling, which to the primitive inhabitant was a subject scarcely worthy of a thought, soon forced itself upon his attention as a subject, above all others, deserving of his careful consideration.

It has become evident that sanitary measures, in order to be efficient, require a recognition of certain laws of nature which had heretofore remained in obscurity.

Sanitary science has now become a recognized branch of medical study, as sanitary engineering has become a branch of the art of construction.

Effective drainage and sewerage has been shown in so many reports, from professional men and government commissions, that its influence on health, as well as length of life, is gradually beginning to be understood.

Drainage and sewerage are essential elements of health in all populous localities.

Calculated as a matter of profit and loss, everything would indicate that the expense required in establishing proper measures to avoid these evils would be far below the loss consequent upon the inefficient arrangement too frequently witnessed at the present time.

The disposal of the solid and liquid refuse becomes a serious problem in large towns and cities. The storing of the filth of a city within the city is to invite disease and death. The soil becomes polluted with sewage, and the air is filled with impure gases arising from the same.

The earth upon which many of our cities stand is completely saturated with sewage, contaminating the air and a constant reminder of the need of an efficient remedy. Few people comprehend to what extent the filth of cesspools contaminates wells from which water is used for domestic purposes.

We often hear it said that water passing through the earth is purified. But, realizing that the earth acts as a sewer and removes only suspended impurities, the part that is in solution remains in the water. Clearness is no proof of purity in water. The water of our mineral springs, although thoroughly impregnated with various minerals, is as clear as ordinary spring-water, and in a glass of water as clear as a crystal there may be poison enough to kill a whole family.

I was reading a short time ago of the Swiss village of Lausen, near

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Basle, which was supplied with water from a spring situated at the foot of a mountainous ridge called the Stockhalden. In this village, where there had not been a single case of fever for many years, an epidemic of typhoid fever broke out and struck down seventeen per cent. of the whole population. The cases of fever were pretty evenly distributed among the families in the village with the exception of six. As the six families which escaped did not use water from the spring, suspicions were aroused concerning the water and investigations were made.

It had formerly been noticed that when the meadows in the Furlerthal, a little valley on the other side of the Stockhalden ridge, were irrigated, the volume of the water in the spring was increased; and by the sinking of the soil in one of the meadows in the Furlerthal a vein of water was discovered which it was supposed led to the spring in Lausen.

It was found upon investigation that a peasant living in Furlerthal had returned from a distant city sick with fever, and that the brook in which his clothes had been washed and into which the slops from the house had been thrown, had been used to irrigate the meadows. This water thus spread over the fields and then filtered through the ridge, a distance of a mile, still carried the germ of disease in it and brought death to the inhabitants of Lausen.

To prove conclusively that the spring was supplied from the Furlerthal, and to determine whether the water passed through an open vein or was filtered through porous material, the following experiments were made: Several hundred-weight of salt was dissolved and poured into the hole in the Furlerthal where the vein was discovered. In a few hours the water of the spring became very salt and the connection between the water in the Furlerthal and the spring at Lausen was established beyond a doubt.

They now mixed two and a-half tons of flour in water and poured it into the hole, but no trace of the flour could be found in the spring, proving that the water was so thoroughly filtered as to remove the minutes particles of the flour and yet still retained its infective properties.

My object in quoting the above is to show to what extent ground saturated with sewage may poison water in wells that are some distance away.

Many of the sewers of this city are simply receptacles for filth, the liquid portion of which is leaking into the soil and gradually poisoning the ground along their route; the solid substance remaining creating poison to be forced into dwellings by way of the connections on every occasion of wind pressure at the outlets, or when filled with storm water.

The sewers of Erie are what is termed the combined system, intended to convey storm water as well as sewage, and, considering the cost of them, they are a poor return for the outlay.

There are 9 6-10 miles of brick sewer in the city, the diameters of which range from one and one-half feet to five feet, costing $222,964.54;

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sewers of brick and stone, 0.135 miles, costing $4,438.31; tile sewers, 19.364 miles, the diameters of which range from twelve to twenty-four inches and costing $210,341.38; total cost of all sewers, $437,744.23; total length, 29.098 miles.

The First ward has 4.271 miles; the Second has 6.718 miles; the Third has 8.906 miles; the Fourth has 5.648 miles; the Fifth has 2.127 miles, including 3,625 feet in the Warfel addition; the Sixth has 1.428 miles.

The outlets are as follows: Little Cascade run receives 4,741 feet, about nine-tenths of a mile; Garrison run receives 5,303 feet, a trifle over one mile; Canal Sewer and laterals, discharging directly into the bay, 24,031 feet, a trifle over four and a-half miles; Peach, French and Holland and laterals, 5,794 feet, about 1 1-10 miles; Mill Creek, 113,769 feet, equal to twenty-one and a-half miles, the whole discharging into the bay by the several routes.

Our tile sewers, especially those put down previous to the past ten years, are mostly useless through incompleteness of construction and flat grades. Many of them are over half filled with the surrounding soil that passes through the joints.

They will not bear the pressure of flushing for the reason that the sections do not line with each other, and the water used for flushing is as liable to cut outside as inside of the pipe. Such of the sewers as have been taken up are exceedingly filthy, and the only remedy is to tear them out, and the sooner this is done the sooner dwellings will be relieved from poisonous gases.

Many of the sewers are extremely shallow and with very flat grades, which makes it difficult for the engineer to find suitable outlets, and unless he sometimes adopts a longer route than would otherwise be necessary he would be liable to add to the number of inefficients.

In one instance where it became necessary in order to pave a street that about 165 feet of sewer be constructed, which at the usual price would have cost $323, it became necessary to construct a sewer costing $2,680 to procure an outlet.

One other sewer, 24 inches in diameter, about 1,300 feet long and costing $2,485, is practically useless so far as outlets for other sewers are concerned. It is barely deep enough to receive the sewage of the residences along its line. Could these old sewers be exterminated without causing other damage it would be a decided benefit, and the public would be the gainer. Why they were constructed in the manner that they were is more than I can comprehend.

The topography of the city of Erie is such that it would seem to suggest to the engineer the position of the main sewers and laterals with but little study. This was forcibly presented to my mind while making a map of the contours of the city for every five feet of eleva-

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tion during the winter of 1886 and 1887. The only study required was to subdue the fall instead of looking for the same.

Where the soil is made up of different strata, some of which are impervious to water, the benefit derived from a properly designed system of sewers is not confined to simply carrying away the sewage, but the water in the soil is drained away.

In some cases special drains will need to be laid to carry the ground water. But it will be found that simply digging the sewer-trench and refilling around the pipe with sand and gravel will make a marked difference in the condition of the surrounding soil. Cutting through the impervious strata and partly refilling the trench with porous material will frequently effectually drain very wet soil. It has been found in several cases where the work on sewers had been delayed and interrupted by running quicksand, that on reopening the trench after a little time the water had mostly disappeared. This has especially been the case during the construction of some of the sewers in Eighteenth street, and it is a matter of surprise to know the area that sometimes will be found drained by this alone. The draining seems to be brought about by the cutting of water courses and the tendency of the water to follow the course of the sewer outside of the pipe.

The effects of a dry subsoil in its influence on the health of residents has been frequently noted, and a greater number of deaths from various diseases is seen where the inhabitants are located upon a retentive formation than takes place when they are located on a porous one.

Although the drainage of the subsoil forms no part of the sewers proper it is undeniable that notwithstanding all efforts to the contrary that so-called impermeable sewers, do to a certain extent, drain the subsoil of the subsoil waters.

There is no difficulty whatever in rendering a brick or pipe sewer water-tight, as it should be, if it be desirable to avoid a deposit of sewage within it, and the trench will still permit the withdrawal of the subsoil water without any further provision for it, provided it be not encountered in too great a volume.

If springs of water occur in the sewer, trench provision must be made for their removal by means of ordinary tile so laid as to collect surrounding water.

I am decidedly opposed to the combined system of sewers for this city, but they are here and here to stay. But if our city fathers or the general public could see the sewers as the engineer sees them, there would be some hope for improvement.

Staley and Pierson say, in their work on the "Separate System of Sewerage," that a theoretically-perfect sewer would be one in which all of the sewage would be carried rapidly to its outfall outside of the city, so that no time would be given for decomposition. The conduit itself should be smooth, impervious to water and should be water-tight

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through its entire length. It should be flushed at intervals, and so thoroughly, that the development of any sewer-gas would be impossible. The large sewers of the combined system are usually constructed of brick. The brick, being porous, allows more or less of the sewage to escape into the soil, even if every joint is water-tight, which is never the case.

The rough surface of the bricks soon becomes covered with a slime of organic matter, which is constantly decomposing.

In designing sewers on this system, the size will be determined by the amount of rainfall per hour during storms and the surface to be drained.

The volume of rainfall to be provided for, is so much more than the sewage that the amount of sewage scarcely enters into the computation. It is readily seen that ordinarily the sewage will be but a trickling stream in a sewer large enough to carry storm-water.

In a rush of water during a storm, however, a considerable quantity of the material which issupposed to remain in the catch-basin is carried into the sewer, and this, with other foreign substances which reach the sewer by reason of absence of catch-basins, settles on the bottom. These obstructions form a series of small dams in the sewer, and in dry weather the sewage stands in a succession of pools along the line, decomposing and sending up volumes of sewer-gas out of every crevice through which it can escape.

The great size of the combined system, it is seen, is detrimental to their efficiency in removing sewage rapidly and completely, and yet for he purpose for which they are supposed to be designed they are seldom large enough. Even where vast sums have been spent to construct the combined system of sewers it is seldom, if ever, that they will carry the water of great storms.

In many large cities, where millions of dollars have been expended for sewers of great size, the extraordinary storms are not provided for and the consequence is, the sewers overflow and cellars and basements are flooded with sewage. Where storm-water is excluded from the sewers, or only a definite amount admitted for the purpose of flushing, no such disaster can occur.

I am decidedly in favor of the separate system for both the eastern and western part of the city, or rather a combination of both systems.

The Liberty street sewer, being a part of what will be known as the intercepting sewer, will take care of all the sewage west of Poplar street, and a good portion of the same between Poplar and Cherry street.

The eastern portion of the city can be taken care of by a sewer up Ash Lane; also by one through Wayne street.

These sewers will be large enough to receive a great part of the surface water in their vicinity. So far as the laterals are concerned, I will rec-

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ommend that they be constructed to convey sewage and nothing else. Under the separate system, aside from the cost of the outlet sewer, the cost of the laterals will be over 70 per cent. less than if constructed to carry street water.

The surface water of the city, east of Parade street, can with little expense, be taken care of by the construction of ordinary gutters paved with cobblestone.

I never could see the necessity for the construction of large sewers for the purpose of carrying storm-water when it can so easily be made to take care of itself by way of the gutters with an occasional stretch of shallow sewer. A little care in grading the street will take care of all the storm-water in the outer districts of this city.

The cost of sewerage works is often made unnecessarily great with the idea that it is the duty of the public to furnish an outlet for factories, slaughter-houses and all manner of establishments which are carried on for individual profit and in which the cost of removing the resultant refuse, is fairly chargeable on the business rather than on the public purse.

So far as the community is concerned it should be compelled to construct sewers only for the removal of such waste matters as are incident to the daily life of all classes of our population.

If breweries, chemical works and other manufactories producing a large amount of liquid waste are to be provided with a means of outlet, this should be done entirely at their own charge. Their profit and convenience should not be advanced at the cost of every member of the community.

The sanitary authority of every city should have entire control over the sewers, with power to decide what shall be admitted to them and what excluded.

The more important considerations affecting the question of town sewerage were stated in the "General Conclusions" of the English Board of Health, after a thorough investigation of the whole subject of sewerage, as follows:

First. That no population living amidst serial impurities arising from putrid emanations from cess-pools, drains or sewers of deposit can be healthy or free from attacks of epidemics.

Second. That as a primary condition to salubrity no ordure or refuse can be permitted to remain beneath or near habitations, and by no other means can remedial operations be so conveniently, economically, inoffensively and quickly effected as by the removal of all such refuse dissolved or suspended in water.

Third. That the general use of large brick sewers has resulted from ignorance and neglect, such sewers being wasteful in construction and repair and costly through inefficient efforts to keep them free from deposits.

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Fourth. That brick and stone house drains are "false in principle and wasteful in the cleansing, construction and repair. That house drains and sewers, properly constructed of vitrified pipe, detain and accumulate no deposit, emit no offensive smells and require no additional supplies of water to keep them clear."

Fifth. All offensive smells proceeding from any works intended for house or town drainage indicate the fact of the detention and decomposition of ordure and afford decisive evidence of malconstruction or of ignorant or defective arrangement.

The subject of the sewerage and drainage of any city is of more importance than of any other one subject connected with any well-regulated municipality.

It should be considered and acted upon prior to any plans for paving or the construction of parks or any work in the way of ornamentation. There can be no question that one improvement stimulates and propagates the other.

The demands of public protection of health are not only of medical interest, but they are at the same time linked together by the closest tie with the welfare of public economy, and with the moral advancement of the people.

Intelligent men must be well aware that, with the exception of the public schools, there are no other means of more surely influencing the moral elevation of the lower classes than the promotion of public and private cleanliness. The sentiment of the people should be thoroughly aroused, and every intelligent man is, or should be, in favor of sanitary reform.

The complete sewering of cities and draining of houses and public grounds must be considered a prime necessity under all conditions and circumstances.

The very best talent of the civilized countries is now employed to improve in all directions the sewage system.

I desire to call attention to the wants of that portion of the city situated north of Eighteenth street and east of Parade street. A great portion of this section is rapidly being built upon, and the nature of the ground is such that it might generally be termed "soaked." Plans and maps are made and can be seen at my office, showing about seven miles of a system that could be put down, if done under one contract, for less than $25,000, excepting the main sewers. Why cannot this be done? It is done in other cities. It would be the saving of many lives, especially of the women and children. It would be a saving to the city, for when a sewer system is put down by piecemeal it becomes expensive to construct.

The same might be said of the sewers west of Cherry street and north of Eighteenth street, except that the need is not so great there; but both are needed and should be pushed to completion.

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The greatest obstacle to the west side is the want of the "Intercepting Sewer."

I will not attempt to predict when it will be constructed, but until it is, the west side will wait a long time for a much needed improvement, unless they are allowed to discharge their sewage by way of the "Little Cascade."

Just at this time it would make but little difference, so far as our source for procuring water to supply the city is concerned, for the bay is receiving all of the sewage of the city by some one of the routes.

I will forbear making any statements relating to our water supply for many reasons.

I am not wedded to the separate system of sewers for all cities, but for cities of this class and smaller ones. Were I called upon to establish and put down a system for effective duty, I would certainly recommend the separate system. With a separate, properly constructed and properly managed system of impervious pipes for the removal of all sewage and with other sound sanitary regulations for the care and removal of solid organic refuse, there is no reason why the spring and well water in towns should not remain clean and wholesome. Besides, when the earth of inhabited places is kept so clean as to preserve the purity of the water, no exhalations will arise from it dangerous to health and life.

I desire to call your attention to the great difference in the cost of the two systems, and will again quote from Staley and Pierson, who say that "among the advantages in favor of the separate system, the one that appeals most strongly to the average citizen, is that of reduced cost." This is the argument that reaches the heart—or which is quite as necessary the pocket—of the taxpayer. One of the grave objections to the combined system is its cost. The actual cost of such systems has been from five to ten dollars per lineal foot. The cost of the separate system has varied from seventy-five cents to two dollars per foot. It is safe to say that under ordinary circumstances its cost will be from one-eighth to one-third of that of the combined system.

Mr. W. J. McAlpine—a very eminent engineer—estimated the cost of a combined system for the city of Schenectady, N. Y., at $240,000. The total cost of the separate system now completed—by the parties from whom I quote—was about $35,000.

It may be asked, why the combined system is still adopted in so many cases, if the advantages of the separate system are so apparent? The answer to that question is, that engineering precedent carries great weight with it among engineers, and venerable error even is hard to put down.

The combined system is one of natural growth. In cities the natural water-courses are covered over and converted into sewers, and branches are built leading to them.

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Then the branches are extended until they form a complete system of sewers. You can see the beginning of this system in almost any town which has a small creek running through it. The creek will partly be covered, and branch drains be constructed leading into it before the subject of sewers is brought up for consideration.

When the matter does come up, the chances are that the system already begun is simply extended and completed, and another bad precedent is set, and makes the introduction of the better system more difficult.

The introduction of the better system marks an important era in the development of sanitary drainage, recognizing as no other system has, the prime importance of an early removal of household and industrial wastes, which are the main factors in soil pollution.

I have no hope that any improvement can be made with our oldest sewers that are already in use until they fail entirely. Whenever attention is called to them, the authorities seem to treat the matter with indifference, and councils will defer action, or move to file the whole matter. The sewers are out of sight, and the disposition seems to be to let them remain so.

I will not dwell upon this matter, for it cannot be treated thoroughly without taking too much time; but I would like to call your attention to the convenience of flushing the smaller sewers.

Wherever the separate system is in use, automatic flush-tanks are constructed in such a manner that from two to three hundred gallons of water can be sent through them each day, week or even month, as desired, keeping the sewer clean and free, leaving no matter to putrify, nor space for sewer-gas.

TYPHUS FEVER, ITS DIAGNOSIS AND PREVENTION.

By WM. B. ATKINSON, A. M., M. D.

Standing as we now do in the presence of a probable invasion of this plague, the result of the filth, and misrule of the European masses, it behoves every physician throughout the length and breadth of the land, but especially those who are located in the direct line of this invasion to be prepared to know the earliest diagnostic signs by which to recognize it. So little opportunity has been afforded for its study in later years, that few physicians have seen a case, and fewer still would be able to detect its presence until too late to interpose the proper means to prevent its rapid spread among the crowded tenements where it would

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most likely be first to make its appearance. Unlike small-pox, the mere naming of which serves to cause a horror to arise among those who may be exposed, it is not regarded by the average person as a special source of danger. Indeed the fear of small-pox even by those who are educated, is in many instances ludicrous in the extreme. They shun the guard who standing in a perfectly safe place, prevents the ingress or egress of any to the infected house. They are violently affected by fear of the face of one who shows its ravages, even when all danger of infection has long gone by. Yet, they needlessly, wilfully expose themselves and their children to the far greater danger of diphtheria or scarlet fever, and refuse to be guided by the advice of the sanitarian, who warns them of the dangers of public funerals, of unnecessary visits to infected houses, of kissing those who are still suffering from the disease. In this connection, I may point a moral by the relation of an instance of recent occurrence. I was summoned by a physician to attend his child, ill with sore throat, who had undoubtedly been infected by the idiotic action of a young man who called at the house, and recklessly kissed the child, though he was still suffering from what he said was an "ulcerated throat."

When typhus fever is known to exist, all persons coming from the locality infected, should be regarded as likely to carry the disease in their systems for at least twenty-one days. During that time they should be kept under careful surveillance, nor should any such persons be permitted to wander round at will lest their clothing, if not their persons may convey the seeds of the infection. Unfortunately, such people do not prefer those neighborhoods where pure air and cleanliness abound, but choose rather the vile, filthy, crowded tenements where the contagion of the disease is most sure to find a congenial soil in which to grow and produce its kind. It may be considered as beyond cavil that typhus fever cannot long exist in the presence of sunlight, pure air, cleanliness, even though poverty and famine may abound. We do not doubt that the latter may be factors in the progress of the disease, yet fortunately the best disinfectants for it are sunlight, pure air, and cleanliness. Hence, by promptly isolating those who have been exposed, and placing them for the proper time under the conditions which are most inimical to the affection, we greatly lessen the tendency to its inception, and its malignancy, should it appear. The question of the length of quarantine requisite for safety, is still subjudice, but we believe twenty-one days will suffice with the employment of proper hygienic measures. In the early diagnosis, it must be remembered that the name typhus is derived from the Greek meaning stupor, and this symptom is always more or less early in its appearance. A person who had been exposed, and who presented this symptom, particularly should it appear suddenly, ought to be regarded with suspicion, and the proper quarantine and isolation should be enforced.

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Rarely if ever, are those prodromic symptoms observed which are incidental to typhoid, where the patient for days or even weeks exhibits lassitude, more or less diarrhoea, etc. In typhus the formative stage is very much shorter, the invasion is abrupt. Usually, but one day elapses before the patient is compelled to go to bed. Another symptom at the outset, is a darkening of the face owing to capillary congestion. Few who have encountered this disease, fail to recognize this condition, and to mark it as widely different from that of typhoid fever. In very many patients, the face early assumes the appearance of a drunkard, utterly wanting in expression. Hence, in cases where the attack has been abrupt, the error has been made of regarding the case as one of drunkenness, and valuable time has been lost. The next marked symptom, which, however, is not always present, is the eruption upon the skin about the beginning of the third day of a maculated rash of a dull red color, which does not disappear under pressure, unless perhaps at a very early period. This eruption is abundant, and usually over the whole surface, even on the face.

While other symptoms may be mentioned which are more or less distinctive of the disease, as the early appearance of sordes in the mouth, greater frequency of the circulation than in typhoid, etc., yet the symptoms enumerated are so marked, and almost invariably appear so early, that we believe they are a sufficient indication of the dangerous affection that is present, and should never be disregarded.

The period of incubation is a variable quantity. Twelve to fourteen days are by many authorities considered the time beyond which it is safe to say that the person who has been exposed will not be affected, yet as in some instances the disease has occurred later, three weeks may be regarded as the proper time during which quarantine should be enforced.

It appears that this disease requires more concentration of the poison in order to extend itself to those around, hence nurses, physicians, etc., while they are occasionally attacked, are less liable to be, and the spread of the disease is readily controlled by hygienic precautions, isolation of those infected, and the destruction or baking of all clothing, etc., of those who are affected with the disease, or who have been compelled for a time to remain in its presence, as on shipboard, etc.

Unlike typhoid, it may be communicated directly from the patient or from infected clothing. While, therefore, quarantine is not necessary in typhoid it becomes imperative in typhus.

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REPORT OF COMMITTEE ON SANITARY CONVENTION HELD AT ERIE.

By S. T. DAVIS, M. D.

HARRISBURG, PA., *May 13, 1892.*

BENJAMIN LEE, M. D., *Secretary:*

DEAR SIR: It is with feelings of great gratification that the Committee on Sanitary Convention feels warranted in reporting the sixth annual convention, held at Erie, Pa., March 29 to 31, 1892, the most successful held under the auspices of the State Board of Health since its organization in 1885. To Dr. A. A. Woods, health officer of Erie, and the gentlemen composing the local committee, in connection with yourself, belong the credit of arranging an excellent programme, which was of sufficient interest to elicit the attention of all in attendance at the meetings. The gentlemen who read papers and took part in the discussions, impressed all in attendance with the importance of the prevention of disease, consequent prolongation of human life and happiness and the merits of the special subjects discussed.

To particularize on the merits of any paper presented would be practicing a partiality without a distinction, or a patent reason. All were good, mainly composed of original matter and presented in language which enable the general public to fully comprehend the subject matter and was calculated to interest them in sanitation.

At the close of the convention the citizens of Erie placed themselves on record as being the first to banquet the State Board of Health of Pennsylvania. Your committee would suggest that the programme form a part of the next annual report of the State Board, and desire also to suggest that a small expenditure of money in billing the town or locality in which future sanitary conventions are to be held would assure more general attendance at the meetings and would be productive of much more good than mere newspaper notices which meet the eyes of the comparatively few. The valuable lessons to be learned at sanitary conventions are not only interesting to physicians and sanitarians, but to become of true value must reach the general public, inasmuch as among the latter class we find the least attention paid to the laws of health.

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4. PROCEEDINGS OF THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH, HELD AT LANSING, MICH., JUNE 6 AND 7, 1892.

Register of members.

Question discussed—The Pollution of Streams.

Paper by Dr. Benjamin Lee.

Discussion by Dr. P. H. Bryce and others.

Report on Pollution of Streams, by Dr. L. F. Salomon.

Second question—Hospitals for Contagious Diseases.

Paper by Dr. C. A. Lindsley.

Discussion by Drs. DeVaux, Munn, Thompson, Baker, Emmert, Walcott, Lachapelle, Wingate.

Third question—The Michigan Plan of Sanitary Conventions.

Paper by Prof. D. Fall.

Fourth question—The Prevention of the Spread of Infectious Disease.

Discussed by Dr. Reeve and others.

Fifth question—Should State Boards of Health be charged with the Administration of Medical Practice Laws?

Paper by Dr. H. B. Baker, The Michigan Plan for the Restriction and Prevention of Dangerous Communicable Diseases.

Steam Disinfection Resolutions, by Dr. G. Homan.

Report on Vital Statistics, by Dr. H. B. Baker.

Report on Prevention of Tuberculosis.

Officers elected.

The Eighth Annual Meeting of the National Conference of the State Boards of Health, Held in the City of Lansing, Michigan, on June 6 and 7.

Promptly at 10 a. m. on the morning of June 6, the members met in the Senate chamber at the State Capital. In the absence of the President, Dr. J. N. McCormack, Dr. Pinckney Thompson, President of the Kentucky State Board of Health, was called to the chair.

Dr. Henry B. Baker, read a telegram received from Dr. C. O. Probst, Secretary of the Conference, which stated that he is unable to come on account of an outbreak of small-pox in Ohio, and that he would be compelled to remain within the limits of that State.

Upon the receipt of this information, Dr. C. N. Metcalf, of Indiana, was elected secretary *pro tem.*

Hon. Frank Wells, of Lansing, a member of the Michigan State Board of Health, welcomed the delegates to the city on behalf of its citizens, and invited them to visit the various public institutions located in its vicinity. Dr. McCormack responded, saying that the Conference would be pleased to accept the kind invitation if time would permit.

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The Secretary was directed to call the roll, which showed that sixteen States and two Provinces of the Dominion of Canada were represented, as follows:

Alabama.—Dr. Jerome Cochran.

Colorado.—Dr. William P. Munn.

Connecticut.—Dr. C. A. Lindsley.

Indiana.—Dr. Samuel R. Seawright, Dr. C. N. Metcalf.

Iowa.—Dr. J. M. Emmert.

Kansas.—Dr. H. D. Hill.

Kentucky.—Dr. J. N. McCormack, Dr. Pinckney Thompson, Dr. George Beeler.

Louisiana.—Dr. L. F. Salomon, Dr. Felix Formento.

Massachusetts.—Dr. Henry P. Walcott.

Michigan.—Dr. Henry B. Baker, Dr. Victor C. Vaughn, Dr. F. G. Novia, Dr. Arthur Hazelwood, Hon. Frank Wells, Prof. Delos Fall, Dr. John Avery, Dr. Mason W. Gray.

New Hampshire.—Dr. Irving A. Watson.

North Dakota.—Dr. F. H. DeVaux, Dr. M. O. Teigen.

Pennsylvania.—Dr. Benjamin Lee.

Tennessee.—Dr. J. Berrien Lindsley.

Vermont.—Dr. J. H. Hamilton, Dr. C. S. Caverly.

Wisconsin.—Dr. J. T. Reeve, Dr. U. O. B. Wingate, Dr. J. C. Johnson.

Province of Ontario.—Dr. P. H. Bryce.

Province of Quebec.—Dr. E. Persillier Lachapelle.

The first question discussed was the one proposed by the Provincial Board of Ontario:

(*a*) Has intra-state, inter-state and international action to prevent the sewage pollution of streams become a necessity?

(*b*) If so, what steps are practicable for bringing about conjoint action?

(*c*) What practicable methods are available for preventing such pollution?

Dr. Benjamin Lee, of Pennsylvania, opened the discussion, as follows:

Mr. PRESIDENT AND GENTLEMEN: The question of the pollution of streams and other sources of water supply on this continent is rapidly assuming the greatest gravity. It is curious to notice how in this, as in moral and social problems, we are gradually making the discovery that America is after all not very different from the rest of the world, and that measures which have been found necessary in the older civilizations for the maintenance of public peace, the fostering of morality and the preservation of the public health, must also eventually be resorted to by us.

In other words physical nature like human nature is the same all the world over, and it only requires the presence of the necessary amount

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of human nature sufficiently condensed to develop invariably certain conditions in physical nature which must be heeded. We are a great people and America is a great country, but even the great American eagle must bow in humility before the universal laws of nature. The problems which are now confronting us in consequence of our rapidly increasing population have forced themselves for many years on the attention of thoughtful minds in England and on the continent of Europe.

It would be then the utmost folly not to avail ourselves of the labor and thought which they have expended upon them. As is well known the result of such study in Great Britain has led to the establishment of a body known as the "Rivers Conservancy Commission," whose duty is to investigate the reality and extent of this alleged evil of pollution of water supplies and to devise means for its remedy. I feel convinced that such a step is rapidly becoming a necessity in this country. The questions naturally suggest themselves, "What are the several State governments doing to protect the purity of public water supplies?" and "To what extent are the State governments capable of preventing the pollution of streams, many of which traverse a large number of States?" This last question is to be considered on its moral as well as physical side. For, while a State government may in the abstract possess the power to prevent the contamination of a stream passing from its territory into that of another State, in the concrete it may find itself quite unable to refute the logic of those who are interested financially in maintaining contamination. I think it will be held to be sound law that no State has a right to pollute or poison a source of water-supply passing into another State any more than an individual has to pollute or poison his neighbor's well. If this be admitted, then, if State governments fail to appreciate their responsibilities in this particular, aggrieved States will have no resource but to petition Congress to enact such legislation as will take the matter out of the hands of the State governments and place it as a question of national hygiene, in those of the national government. In order to furnish data for the commencement of the investigation of this problem, I some few months since, formulated a brief series of questions addressed to the Secretaries of State Boards of Health as follows:

Secretary State Board of Health of

. . . . . .

DEAR DOCTOR: Shall I be trespassing too much upon your valuable time, if I request brief replies to the following interrogatories?

1. Has your State any laws prohibiting the pollution of streams or other inland waters?

2. Has your Board adopted any regulation upon this subject?

3. If either or both, kindly send me copies of the same if procurable.

4. Do any streams enter or traverse your State which have become seriously polluted in other States?

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5. Do any streams which have become seriously polluted in your State enter or traverse other States?

6. In your opinion is it wise or politic to attempt to preserve the purity of streams, or should we not rather allow them to be used as sewers and seek our supplies of drinking water from other sources?

7. If you favor the former alternative, do you consider it expedient, in view of the fact that so many of our streams pass from one State into another to petition Congress for the passage of a law forbidding the pollution of streams throughout the entire country, and establishing a "Rivers Conservancy Commission" for the purpose of enforcing such law?

Awaiting a reply to the above inquiries, at your convenience,

Yours very respectfully,

BENJAMIN LEE,

Secretary State Board of Health of Pennsylvania.

1532 Pine street, January 18, 1892.

An analysis of the replies kindly sent by the secretaries of twenty-three boards gives the following results:

In reply to question No. 1. "Has your State any laws prohibiting the pollution of streams or other inland waters?"

The following named States and provinces possess general legislative enactments for the preservation of the purity of water supplies and streams or other collections of water: Kentucky, Delaware, Wisconsin, New York, Massachusetts, Minnesota, Maryland, West Virginia, New Jersey, Ontario, Quebec, Illinois, California. In all thirteen.

The following named State possesses special legislative enactments for protecting the purity of the water-supplies of certain cities only: Pennsylvania.

In the following named States and provinces the legislatures have made it the duty of the State Board of Health to protect the purity of the water supplies, and conferred upon them powers more or less complete for performing this duty: Delaware, New York, Ontario, Quebec, Minnesota, Massachusetts. In all six.

In reply to question No. 2. "Has your Board adopted any regulation upon this subject?" In the following named States the State Board of Health has either by regulation, resolution or executive action attempted to protect the purity of inland waters: Massachusetts, Connecticut, West Virginia, New York, Delaware, Kentucky, Maryland, Wisconsin, Minnesota, Ontario, New Jersey, Illinois, California, Rhode Island, Province of Quebec, Pennsylvania. In all sixteen.

In reply to question No. 6. "Is it wise or politic to attempt to preserve the purity of streams, or should we not rather allow them to be used as sewers and seek our supplies of drinking water from other sources?"

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The secretaries of the following named States pronounced unequivocally in favor of making every effort to prevent the pollution of streams and, as far as possible, to keep all impurities from entering them, viz: Minnesota, Wisconsin, Vermont, Kentucky, Delaware, New York, Province of Ontario, Missouri, North Carolina, Maryland, Province of Quebec. In all eleven.

The secretaries of the following named Boards doubt the feasibility or possibility of preventing pollution to a very considerable extent, and therefore declare in favor of permitting streams to be used freely and unrestrictedly as sewers, and looking elsewhere for drinking water, viz: Alabama, Florida, Louisiana, Oklahoma territory, Rhode Island, South Carolina. In all six.

The secretaries of the following named State Boards considered that the question could not be answered categorically, but that each case of pollution or threatened pollution should be decided upon its merits as it arises: Massachusetts, California, Illinois, Connecticut, Michigan, West Virginia, New Jersey. In all seven.

In reply to question No. 7. "If you favor the former alternative, do you consider it expedient, in view of the fact that so many of our streams pass from one State into another, to petition Congress for the passage of a law forbidding the pollution of streams throughout the entire country, and establishing a 'River's Conservancy Commission' for the purpose of enforcing such a law?" The secretaries of the following named States expressed themselves as in favor of such legislation: Louisiana, Delaware, Province of Ontario, Missouri, Maryland, South Carolina, Illinois, Connecticut, Michigan, West Virginia, Wisconsin, Vermont, Kentucky, Province of Quebec. In all fourteen.

Dr. N. D. Baker, of West Virginia, says: "I would join in earnestly urging the above action upon Congress."

Dr. F. W. Reilly, of Illinois, says: "The proposition to secure a Rivers Conservancy Commission, with power, authority and means to determine individual cases on the basis of individual conditions has my hearty endorsement."

Dr. C. W. Chancellor, of Maryland, says: "I am decidedly in favor of a 'Rivers Conservancy Commission' with strong laws to prevent pollution of any water-way. The general government will be forced at an early period to enact a law to protect the water supply of Washington city, which is already greatly polluted by the States of West Virginia, Virginia and Maryland. Congress alone can remedy the evil."

Dr. R. C. Atkinson, of Missouri, says: "I heartily approve of such a measure. In my opinion it is in many instances wise and politic to attempt to preserve the purity of streams for the one reason above all others that they are often the only sources of supply of drinking water for large communities, which, from their environment, can obtain no other. As a notable example I mention the city of St. Louis, whose

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surrounding country is so saturated with coal and its products and associate minerals, that artesian wells have, in all instances, afforded only sulphur water. Another reason is that ice is gathered in large quantities from these rivers, and we know that ice does retain many of the impurities contained in the unfrozen waters."

Dr. P. H. Bryce, of Toronto, says: "I think the suggestion that the question of the pollution of streams be taken up as a Congressional matter should be approved of and urged by all interested in State or international sanitation."

Mr. E. B. Frazer, of Delaware, says: "I heartily approve of the above. Protect the streams, keep them as the Almighty made them."

The secretaries of the following State Boards are decidedly opposed to invoking the authority of Congress, believing that the separate States are fully capable of dealing with this problem: Rhode Island, Florida, Massachusetts, New Jersey, Minnesota, California.

It will thus be seen that the consensus of opinion of practical sanitarians is strongly in favor of legislative interference for the protection of the purity of water supplies and streams; that in several States such opinion has crystallized into a public sentiment of such force as to compel the unwilling acquiescence of legislators and lead to the passage of laws for the purpose; that as an ideal question all regard it favorably; but that, as a practical question, the varying conditions of the several States modify the opinions of those residing therein. In some instances the drainage problems of the country are such as to make it appear almost an impossibility to prevent the pollution of streams; in others the manufacturing interests are paramount to all other considerations; and in a third class, the country is so sparsely peopled and there is such an entire absence of manufacturing industries, that the question is not with them an urgent one. Wherever it has forced itself upon the attention of sanitarians, and the difficulties are not so great as to make them appear at first sight insurmountable, but one opinion has been entertained and expressed.

In coming to a decision on this really momentous question, it is in the highest degree desirable that we should allow hygienic considerations and the interests of human life alone to have weight! Shall we permit local jealousies or inherited prejudices or questions of political organization to influence us? Are not thinking men who reside in large cities beginning to wake up to the fact that so far as municipal government is concerned we have been grasping at the shadow of liberty only to lose the substance? Shall we allow the bogy of centralization of power to deter us from advocating a measure which may prove the salvation of thousands of lives?

The States of Minnesota and New York are those which have adopted what appear to me the most stringent and practical laws upon this subject, and time will not be lost in rehearsing their important features.

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That of Minnesota, founded on the original law of Massachusetts, which has since been considerably modified, is as follows:

AN ACT to prevent the pollution of rivers and sources of water supply.—Chapter 225, laws of 1885.

To be enacted by the Legislature of the State of Minnesota.

SECTION 1. No sewage, drainage, or refuse or polluting matter of such kind as either by itself or in connection with other matter will corrupt or impair the quality of the water of any spring, well, pond, lake, stream or river for domestic use, or render it injurious to health, and no human or animal excrement shall be placed in or discharged into, or placed or deposited upon the ice of any pond, lake, stream or river used as a source of water supply by any town, village or city; nor shall any such sewage, drainage, refuse or polluting matter or excrement be placed upon the banks of any such pond, lake, stream or river within five miles above the point where such supply is taken, or into any feeders or the banks thereof of any such pond, lake, stream or river.

SECTION 2. The State Board of Health shall have the general supervision of all springs, wells, ponds, lakes, streams or rivers used by any town, village or city as a source of water supply, with reference to their purity, together with the waters feeding the same, and shall examine the same from time to time and inquire what, if any, pollutions exist, and their causes. In case of the violation of any of the provisions of section one (1) of this act, said Board may appoint a time and place for hearing parties to be affected, and shall give due notice thereof as hereinafter provided to such parties, and after such hearing, if in its judgment the public health requires it, may order any person or corporation, or municipal corporation to desist from the acts causing such pollutions, or to cleanse or purify the polluting substance in such a manner and to such a degree as shall be directed by said Board before being cast or allowed to flow into the waters thereby polluted, or placed or deposited upon the ice or banks of any of the bodies of water in the first section of this act mentioned. Upon the application of the proper officers of any town, village or city, or of not less than ——— legal voters of any such town, village or city to said Board, alleging the pollution of water supply of any such town, village or city by the violation of any of the provisions of this act, said Board shall investigate the alleged pollution, and shall appoint a time and place when and where it will hear and examine the matter, and shall give notice of such hearing and examination to the complainant, and also to the person or corporation, or municipal corporation alleged to have caused such pollution, and such notice shall be served not less than ten (10) days prior to the time so appointed, and shall be served in the same manner that now is, or hereafter may be by law provided for the service of a summons in a civil action in the district court. Said Board, if in its judgment any of the

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provisions of this act have been violated, shall issue the order or orders already mentioned in this section.

SECTION 3. The district court or the judge thereof may, upon the complaint of said Board, or of the proper authorities of any town, city or village whose sources of water supply shall be so polluted, issue an injunction to enforce the orders of said Board.

SECTION 4. Such orders of the State Board shall be served upon the persons, corporations or municipal corporations found to have violated any of the provisions of this act, and any party aggrieved thereby shall have the right to appeal to the district court of the county in which is situated the town, village or city whose source of water supply is found to have been polluted, and such aggrieved party shall have the right to a trial by jury in the same manner as in a civil action in said court. During the pendency of the appeal the pollution against which the order has been issued shall not be continued contrary to the order of the State Board, and upon the violation of the order the appeal shall be forthwith dismissed.

SECTION 5. Any person, corporation or municipal corporation desiring to appeal from any such order of the State Board shall, within thirty (30) days after the service upon him or it of a copy of such order file, in the office of the clerk of the district court of the proper county a notice of such appeal, together with a bond in the sum of not less than two thousand (2,000) dollars, with two (2) sureties, to be approved by the judge of said court, conditioned for the prosecution of such appeal to judgment, and for the payment of all the costs and disbursements that may be adjudged against him or it therein, and shall, within three (3) days after such filing, serve a copy of such notice and bond upon the Secretary of the Board. Said Secretary shall within ten (10) days thereafter deliver such copies so served upon him to the mayor or other chief executive officer of any such city, village or town whose source of water supply has been found to have been so polluted.

SECTION 6. Water boards, water commissioners, water companies, and the proper officers of any city, village or town making use as a source of water supply of any well, spring, pond, lake, stream, river, reservoir or well within, or partly within this State, and distributing the waters thereof for public, domestic and general uses shall, from time to time, and whenever required by said Board, make returns to said Board upon blanks to be furnished by it, of such matters as may be required by said Board and called for by such blanks; and any such water board, water commissioners, water company, or officers of any city, village or town who shall, for the space of thirty (30) days after being furnished with such blanks, fail or neglect to make any such report so required shall, for each and every such neglect or failure, forfeit and pay the sum of one hundred (100) dollars for the use of the local board of health, or the proper officers acting as such of the city, town or village where such

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delinquent has its principal office. Said State Board shall, in the name of the State, prosecute in the district court of the proper county an action for the recovery of the penalty or forfeit therein imposed.

SECTION 7. This act shall take effect and be in force from and after its passage.

Approved March 7, 1885.

That of New York, while efficacious for the prevention of pollutions of a minor character, is hampered by a restriction in regard to the purification of sewage or alteration of systems of sewerage, which at first sight would seem to largely deprive it of value. It reads as follows:

AN ACT to confer upon the State Board of Health power to protect from contamination, by suitable regulations, the water supplies of the State and their sources, passed June 13, 1885.—Chapter 543, laws of 1885.

To The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The State Board of Health is hereby authorized and empowered to make rules and regulations for protecting from contamination any and all public supplies of potable waters and their sources within this State: *Provided, however,* Any such rule or regulation shall not be operative in any county until the county judge of that county shall approve the same.

SECTION 2. The said State Board of Health shall also have power, and it shall be its duty, 1. To publish once a week for at least six consecutive weeks all such rules and regulations as it shall have made concerning the contamination of any sub-soil waters, spring, streams, lakes, ponds, reservoirs or other bodies of water contributing to the potable water supply of any municipality within this State, such publication to be made in one or more newspapers published in the county in which the waters affected by such regulations are located. The cost of publishing the regulations of the State Board of Health, as above provided, shall be paid by the corporation or municipality benefited by the protection of the water supply, concerning which the rules are made. 2. To impose penalties for the violation of or the non-compliance with their rules and regulations not exceeding two hundred dollars in any one case.

SECTION 3. The officer or board having by law the management and control of the potable water supply of any municipality, in all cases where the said municipality derives its water supply in whole or in part from any sub-soil water springs, streams, lakes, ponds, reservoirs, or other waters concerning which the State Board of Health shall make any rule or regulation, is hereby authorized and empowered to make such inspection of the sources of said water supply as said officer or board may deem advisable to secure the said water supply from any defilement, and to ascertain whether or not the rules and regulations made by the State Board of Health are complied with.

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SECTION 4. In case such inspections shall disclose the violation by any person or persons of any of the rules or regulations of the said State Board of Health relating to the sources of said water supply, the officer or board mentioned in section three of this act shall serve or cause to be served, a copy of the said rules and regulations, accompanied by a notice specifying the rule or regulation claimed to have been violated, upon the said person or persons violating such rules or regulations. If the person or persons so served do not immediately comply with the said regulation, the said officer or board having charge of the water supply of the municipality affected thereby, shall notify the State Board of Health of the violation of its rules; the State Board of Health shall thereupon examine into the said violation, and if the party complained of is found to have actually violated any of the said regulations, the Secretary of the State Board of Health shall order the local board of health having jurisdiction thereof to convene and enforce obedience to the said regulation.

SECTION 5. In case any local board of health having jurisdiction thereof fails to enforce the order of the Secretary of the State Board of Health within ten days after the receipt of a notification so to do, as provided in the last section, the corporation furnishing the water supply, or the municipality deriving its water supply from the waters for the sanitary protection of which such rules have been made, is hereby authorized and empowered to maintain an action in a court of record and which shall be tried in the county in which the cause of action arose against the person or persons violating the said rules for the recovery of the penalty therein provided.

SECTION 6. Every person who shall willfully violate or refuse to obey any rule or regulation made and published by the State Board of Health and approved pursuant to the provisions of this act, shall be guilty of a misdemeanor and on conviction thereof shall be subject to a fine or imprisonment, or both, at the discretion of the court, such fine not to exceed three hundred dollars, nor such imprisonment six months. But the recovery of a penalty in a civil action, as provided in section five of this act, and criminal prosecution and conviction under the provisions of this section, shall not be had for the same offense.

SECTION 7. When the State Board of Health shall, for the protection of a water supply from contamination, make regulations, the execution of which will require the providing of some public means of removal or purification of sewage, the **municipality or corporation owning the waterworks benefited thereby shall, at its own expense, construct* and maintain such works or means for sewage disposal, as shall be approved by the State Board of Health.

SECTION 8. The State Board of Health, any local board of health, or any municipality or corporation furnishing water, may cause the affidavit

*Italicized by the writer

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of the printer, publisher or proprietor of any newspaper publishing the rules and regulations, as provided by the second section of this act, to be filed with such rules as published in the clerk's office of the county in which the municipality or corporation furnishing the water supply in any case may be situated or located, and such affidavit and rules, or duly certified copies thereof, shall be deemed conclusive evidence of due publication and of all the facts therein stated in all courts and in all proceedings or prosecutions under the provisions of this act.

SECTION 9. All acts or parts of acts inconsistent with the provision of this act are hereby repealed.

SECTION 10. This act shall take effect immediately.

AN ACT to amend chapter five hundred and forty-three of the laws of eighteen hundred and eighty-five, entitled "An act to confer upon the State Board of Health power to protect from contamination, by suitable regulations, the water supplies of the State and their sources," relative to the construction of systems of sewerage, and works for the removal and disposal of sewage and the removal of buildings and giving a right of action for damages.

Approved by the Governor, June 2, 1890. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section seven of chapter five hundred and forty-three of the laws of eighteen hundred and eighty-five, entitled "An act to confer upon the State Board of Health power to protect from contamination, by suitable regulation, the water supplies of the State and their sources," is hereby amended so as to read as follows:

SECTION 7. When the State Board of Health shall, for the protection of a water supply from contamination, make regulations, the execution of which will require, or will make necessary, the construction and maintaining of any system of sewerage, or a change thereof, in any or for any village or hamlet, whether the same be incorporated or otherwise, or the execution of which will require the providing of some public means of removal or purification of sewage, the municipality or corporation owning the water works benefited thereby, shall, at its own expense, construct and maintain such system or systems of sewage, or change thereof, and also provide such means of removal and purification of sewage, and also such works or means for sewage disposal as shall be approved by the State Board of Health; and when the execution of any of the said regulations of the State Board of Health will occasion or require the removal of any building or buildings, the municipality or corporation owning the water-works benefited thereby shall, at its own expense, remove said buildings and pay to the owner thereof all damages occasioned by such removal; and when the execution of any such regulation will injuriously affect any manufacturing or industrial enterprise which is not a public nuisance, the said municipality or corporation shall

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pay all damages occasioned by the enforcement thereof. And until such construction or change of such system or systems of sewage, and such works or means for sewage disposal, and the removal of any building, is so made by the said municipality or corporation owning the water-works to be benefited thereby, at its own expense, there shall be no action or proceeding taken against any person or corporation for the violation of any regulation of the State Board of Health under this act; and no person or corporation shall be considered to have violated or refused to obey any such rule or regulation. And the owner or owners of any building, the removal of which is occasioned or required or has been removed by any rule or regulation of the State Board of Health made under the provisions of this act, and all persons whose rights of property are injuriously affected by the enforcement of any such rule or regulation, shall have a right of action against the municipality or corporation owning the water-works benefitted by the enforcement of such rule or regulation, for all damages occasioned or sustained by such removal and enforcement of said rule or regulation or either; and an action therefor may be brought against such municipality or corporation in any court of record in the county in which the premises or property affected is situated, and shall be tried therein.

SECTION 2. This act shall take effect immediately.

The following acts or parts of acts in other States refer more or less directly to this matter:

WEST VIRGINIA.

ACT preventing the deposit of the carcasses of dead animals and other noxious matters in certain waters in this State, or upon the surface of any road, street, alley, city lot, public ground, market space or commons, and providing for the abatement of the nuisance occasioned by such deposit, and the punishment for violations of this act.

I. It shall be unlawful to put the carcass of any dead animal, or the offal from any slaughter house, butcher's establishment or packing house, or slop or any other refuse from any hotel or tavern, or any spoiled meats or spoiled fish, or any putrid animal substance, or the contents of any privy vault, upon or into any river, creek or other stream within this State, or upon the surface of any road, street, alley, city lot, public ground, market space or common, or on the surface within one hundred feet of any public road.

II. It shall be unlawful for the owner or occupier of any city or town lot, public ground, market space or common, to knowingly permit any of the things named in the preceeding section to remain thereon, to the annoyance of any of the citizens of this State, or neglect or refuse to remove or abate the nuisance occasioned thereby, within twenty-four hours after the knowledge of the existence of such nuisance, upon any of the premises in this section before mentioned, owned or occupied by him, or after notice thereof in writing from any justice of the peace, or

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constable of any district, or the mayor or health officer of any municipal corporation in which any such nuisance exists.

III. A justice of the peace shall have jurisdiction of any offense against the provisions of this act, committed within his county. Any such offense shall be punished by a fine of not less than five nor more than fifty dollars, and the proceeding in the case, as well as in all other cases under this act, shall be in conformity with sections two hundred and twenty-one to two hundred and thirty inclusive, of chapter fifty of the code of West Virginia, which sections are hereby made applicable to such cases. Upon a conviction for any such offense, the accused must bury at least three feet under ground, or destroy by fire any of the things named in the first section, which he has placed in any of the waters or places named in such section, or which he has knowingly permitted to remain, upon a city lot, public ground, market space, common, contrary to the provisions of the second, within twenty-four hours after such conviction, and if he shall fail so to do, the justice shall further fine him not less than ten nor more than fifty dollars.

WISCONSIN.

[Revised Statutes.]

Building and removal of slaughter houses.

No person shall erect, maintain or keep any slaughter house upon the bank of any river, running stream or creek, or throw or deposit in such running stream any dead animal or part thereof, or any of the carcasses or offal therefrom, into or upon the bank of any such river, stream or creek which shall flow through any city or village, or erect, maintain or use any building for a slaughter house, within the limits of any village, incorporated or unincorporated, or any organized town containing two hundred or more inhabitants, or at any place within one-eighth of a mile of any dwelling house or building used as a place of business; and every person who shall violate any of the provisions of this section shall forfeit for each such violation not less than ten nor more than one hundred dollars; and the mayor of the city, president of the village and the chairman of the town in which any such slaughter house is located, shall have power to, and shall cause the same to be immediately removed; and every such officer who shall knowingly permit any slaughter house to be used or maintained contrary to the provisions of this section, shall forfeit not less than fifteen nor more than fifty dollars. In any county containing a population of one hundred thousand or over, all the provisions of this section relating to slaughter houses shall apply to all establishments and manufacturies in which dead animals or any part thereof, or any of the carcasses or offal therefrom are collected and converted into marketable products.

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DELAWARE.

[Revised Code.]

AN ACT to define and prevent certain nuisances.

SECTION 1. That hereafter no person or persons shall cast, put, place, discharge in or permit or suffer to be cast, put, placed, discharged in, or to escape into any running stream of water within the limits of this State, from which stream the inhabitants of any borough, town or city within this State are supplied wholly or in part with water for and as a drink or beverage, any dye stuffs, drugs, chemicals or other substance, or matter of any kind whatsoever, whereby and by means whereof the said water so supplied as for a drink or beverage as aforesaid shall be made and become noxious to the health or disagreeable to the sense of smell or taste.

SECTION 2. Every person offending against the provisions of the preceding section of this act shall be deemed guilty of committing a common nuisance, and, upon conviction thereof by indictment in the court of general sessions of the peace and jail delivery, shall be fined from one thousand to five thousand dollars at the discretion of the court; and in addition to the fine aforesaid the court shall issue an order for the abatement of the nuisance within twenty days after the verdict of the jury upon the indictment aforesaid, and the sheriff of either of the counties of this State in which said conviction shall take place shall, under the order aforesaid, unless the said nuisance shall, before the expiration of the time allowed for the abatement of the said nuisance have been abated, have full power to abate the same, and to this end shall enter on the premises from which the said nuisance proceeded and arrest, stop and put an end to the business from the carrying on of which, or in the process of which the said nuisance was created or carried on, or premises from which the said nuisances proceeded and issued.

SECTION 3. That no person thereafter shall put or place, or permit to be put, placed or used, any privy, hog pen or slaughter house over, or so near that the excrement or offal therefrom shall escape or run into, any stream of running water within the limits of this State from which the inhabitants of any town, borough or city within the limits aforesaid are wholly or in part furnished with water as a drink or beverage; and any one offending against the provisions of this section shall be deemed to be guilty of committing a common nuisance, and, upon conviction thereof in the court aforesaid, shall be fined the sum of one hundred dollars, and the court shall order the nuisance to be abated immediately.

CALIFORNIA.

[Penal Code, Sec. 374.]

Every person who puts the carcass of any dead animal, or the offal from any slaughter-house, corral, or butcher shop, into any river, creek, pond, reservoir, stream, alley, public highway or road in common use, or who attempts to destroy the same by fire within one fourth of a mile

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of any city, town, or village, and every person who puts the carcass of any dead animal, or any offal of any kind, in or upon the borders of any stream, pond, lake, or reservoir, from which water is drawn for the supply of the inhabitants of any city, city and county, or any town, in this State, so that the drainage from such carcass or offal may be taken up by or in such stream, pond, lake, or reservoir, or who allows the carcass of any dead animal, or any offal of any kind, to remain in or upon the borders of any such stream, pond, lake, or reservoir, within the boundaries of any lands owned or occupied by him, or who keeps any horses, mules, cattle, swine, sheep, or live stock of any kind, penned, corraled, or housed on, over, or on the borders of any such stream, pond, lake, or reservoir, so that the waters thereof shall become polluted by reason thereof, is guilty of a misdemeanor, and upon conviction thereof shall be punished as prescribed in section three hundred and seventy-seven of this code. (In effect March 23, 1876.)

VERMONT.

Revised Laws, Preservation of Public Health, Sec. 3,926.

If a person puts or causes to be put a dead animal or animal substance into, or upon the bank of, so that it be drawn or washed into, a lake, pond, running stream or spring of water and suffers the same to remain he shall forfeit not more than twenty dollars and not less than five dollars, with costs, to the town in which the offense was committed, to be recovered before a justice.

ILLINOIS.

Article V.—*Nuisances.*

SECTION 1. That it is a public nuisance to cause or suffer the carcass of any animal or any offal, filth or noisome substance to be collected, deposited or to remain in any place, to the prejudice of others.

To throw or deposit any offal or other offensive matter, or the carcass of any animal, in any water-course, lake, pond, spring, well or common sewer, street or public highway.

To corrupt or render unwholesome or impure the water of any spring, river, stream, pond or lake, to the injury or prejudice of others

WATER SUPPLY.

SECTION 1. The city council or board of trustees shall have the power to provide for the supply of water by boring and sinking artesian wells, or by the construction and regulation of wells, pumps, cisterns, reservoirs, or water-works, and to borrow money therefor, and to authorize any person or private corporation to contract and maintain the same, at such rates as may be fixed by ordinance, and for a period not exceeding thirty years; also to prevent the unnecessary waste of water; to prevent the pollution of the water, and injuries to such wells, pumps, cisterns, reservoirs or water-works.

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SECTION 2. For the purpose of establishing and supplying water-works, any city or village may go beyond its territorial limits, and may take, hold, and acquire property by purchase or otherwise; and shall have power to take and condemn all necessary lands or property therefor, in the manner provided for the taking or injuring private property for public uses; and the jurisdiction of the city or village to prevent or punish any pollution or injury to the stream or source of water, or to such water-works, shall extend five miles beyond its corporate limits, or so far as such water-works may extend.

INDIANA.

SECTION 2067. Whoever builds, erects, continues or keeps up any dam or other obstruction to any stream of water and thereby produces stagnant water which is manifestly injurious to the public health and safety shall be fined not more than five hundred dollars nor less than ten dollars.

SECTION 2068. Whoever puts the carcass of any dead animal, or the offal from any slaughter-house or butcher's establishment, packing house of fish-house, or any spoiled meats or spoiled fish, or any putrid animal substance, or the contents of any privy vault, upon or into any river, pond, canal, lake, public ground, market place, common field, meadow, lot, road, street or alley, and whoever, being the owner, or occupant of such place, knowingly permits any such thing to remain therein to the annoyance and injury of any of the citizens of this State, or neglects or refuses to remove or abate the nuisance occasioned thereby within twenty-four hours after knowledge of the existence of such nuisance upon any of the above described premises owned or occupied by him, or after notice thereof, in writing from any health officer of the city, or the trustee of the township in which such nuisance exists, shall be fined not more than one hundred dollars nor less than one dollar.

SECTION 2075. Whoever maliciously or mischievously puts any dead animal, carcass or part thereof, or any other putrid, nauseous, noisome or offensive substance, upon any highway, or in any manner befouls any well, cistern, spring, brook, canal or stream of running water, or any reservoir of water-works, of which any use is, or may be made for domestic purposes, shall be fined not more than one hundred dollars nor less than five dollars, to which may be added imprisonment in the county jail not more than sixty days or less than ten days.

KENTUCKY.

SECTION 2. If any person shall willfully cast or place the carcass of any dead horse, mule, cow, hog or sheep, or that of any other dead beast in any water course, or shall willfully cast the same into any spring, or into any pond, such persons for every such offense shall be fined for the

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first offense not less than five nor more than twenty dollars, and for every subsequent offense not less than twenty nor more than one hundred dollars.

MICHIGAN.

Disposal of Dead Animals.

SECTION 1. *The people of the State of Michigan enact,* That if any person or persons shall put any dead animal, or part of the carcass of any dead animal into any lake, river, creek, pond, road, street, alley, lane, lot, field, meadow or common, or in any place within one mile of the residence of any person or persons, except the same and every part thereof be buried at least two feet under ground; and if the owner or owners thereof shall knowingly permit the same to remain in any of the aforesaid places to the injury of the health, or to the annoyance of the citizens of this State, or any of them, every person so offending shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall forfeit and pay a sum not less than five dollars nor more than ten dollars, together with the costs of prosecution, and in default in the payment thereof shall be imprisoned in the county jail of the county in which such conviction may be had not exceeding ten days, to be imposed by any court of competent jurisdiction; and every twenty-four hours said owner may permit the same to remain after such conviction shall be deemed an additional offense against the provisions of this act, and upon conviction thereof shall forfeit and pay a sum of not less than ten dollars and not more than thirty dollars, together with the costs of prosecution, to be recovered as aforesaid, and in default in the payment thereof imprisoned as aforesaid not more than thirty days, or be punished by both such fine and imprisonment in the discretion of the court.

From Chapter XVII. Harbors, Wharves and Harbor Masters.

SECTION 4. The council shall have authority to provide by ordinance for the preservation of the purity of the waters of any harbor, river or other waters within the city, and within one-half of a mile from the corporate boundaries thereof, to prohibit and punish the casting or depositing therein of any filth, logs, floating matter, or any injurious thing.

Protection of Fish and Fisheries.

SECTION 1. *The people of the State of Michigan enact,* That it shall be unlawful for all persons to put into any of the waters of this State where fish are taken any offal, blood, putrid brine, putrid fish, or filth of any description, and any person so offending shall be fined in any sum not exceeding three hundred dollars, or imprisonment not exceeding thirty days, or both at the discretion of the court.

SECTION 2. All fish, offal or filth of any description whatsoever accruing from the curing and catching of fish, shall be burned or buried ten rods distant from the beach or shore of the river or lake.

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SECTION 6. Any act in contravention of sections two, four and five of this act shall subject all parties concerned in the breach of the said sections, whether the actual transgressors or accessories, to a penalty of not more than one hundred dollars nor less than twenty-five dollars, with all expense of prosecution, or to imprisonment in the county jail for a period not exceeding thirty days, or both at the discretion of the court.

IOWA.

Protection of the Public Health.

SECTION 4041. If any person throw, or cause to be thrown any dead animal into any river, well, spring, cistern, reservoir, stream or pond, he shall be punished by imprisonment in the county jail not less than ten nor more than thirty days, or by fine not less than five nor more than one hundred dollars.

ONTARIO.

Water Supply and Sewerage.

Whenever the establishment of a public water supply or system of sewerage shall be contemplated by the council of any city, town or village, it shall be the duty of the said council to place itself in communication with the Provincial Board of Health, and to submit to the said Board, before their adoption, all plans in connection with said system.

It shall be the duty of the Provincial Board of Health to report whether, in its opinion, the said system is calculated to meet the sanitary requirement of the inhabitants of the said municipality; whether any of its provisions are likely to prove prejudicial to the health of any of the said inhabitants, together with any suggestions which it may deem advisable, and to cause copies of said report to be transmitted to the minister of the department to which the said Provincial Board of Health is attached, and to the clerk of the municipal council and the secretary of the local board of health of the district interested.

No sewer or appliance for the ventilation of the same shall be constructed in violation of any of the principles laid down by the Provincial Board of Health, subject to appeal to the Lieutenant Governor in council.

No person shall within this municipality suffer the accumulation upon his premises, or deposit or permit the deposit upon any lot belonging to him, of anything which may endanger the public health, or deposit upon, on or into any street, square, lane, byway, wharf, dock, slip, lake, pond, bank, harbor, river, stream, sewer or water, any manure or other refuse, or vegetable or animal matter, or other filth.

Dr. Peter H. Bryce, of Ontario, followed Dr. Lee in the discussion.

MR. PRESIDENT AND GENTLEMEN OF THE CONFERENCE: In discussing the subject assigned to me I do not propose to enter upon an historic

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account of either the views that have been held or of the attempts which have been made to deal with the problem. I shall therefore endeavor to deal with its practical aspects, with which we, as executive officers of health, are naturally expected to deal.

Much has been written on the subject with a view to laying down general principles intended to apply to the question of river pollution in all localities and under all conditions. I believe I am expressing the views of most here when I say that, owing to this, probably, more than any other cause, we find ourselves to-day met with statements and counter-statements as to the evil effects of such pollution, which have proved most detrimental to the advancement of public knowledge and municipal improvement in methods of sewage disposal.

There exist, however, other and most serious obstacles which have obstructed the progress of the question. Some of these are:

1. Individual selfishness and municipal parsimony in dealing with the questions of public water supplies and disposal of sewage.

2. The various standpoints from which the subject is approached such as (a) that of the engineer; (b) that of the health officer; (c) that of the chemist; (d) and that of the biologist. The engineer seeks for the best point or points for an outfall toward which his sewer mains shall converge, and afford him proper levels in his laterals.

The health officer very properly is concerned in seeing that this outfall shall be so located, as to at least prevent a local nuisance or injurious effects to the residents of his own municipality.

The chemist thinks that if a river water in organic constituents is no worse than many natural waters that it is fairly safe.

The biologist is inclined to settle the purity of a stream off-hand by the number of living bacterial forms he finds present.

While difficulties such as those just pointed out may be said to attach to the consideration of any question, they yet have assumed special prominence in the subject of our discussion, since to each belong some one or more important elements in the formation of any comprehensive or correct conclusion. For instance, if in a swift-flowing river, sewage is deposited in the middle of the channel, the coarse materials having been retained in a penstock, and should water be taken from the river some miles down the stream, it may in some instances have been found possible to not only create no local nuisance, but to show no notable evidence of sewage contamination to the water supply below. Again, the chemist if he has in the above instance found the water below such an outfall improve with distance, asserts with much confidence that the sewage by sedimentation, oxidation, etc., has disappeared, and that the river water maintains its potable character. Similarly in the same instance, if trade refuse added to the sewage has served to prevent some of the bacterial forms peculiar to a river water from being more abun-

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dant below than above such a sewage outfall, the biologist might similarly be slow to condemn such a river water for drinking purposes.

But if we view the question from, as far as possible, the totality of conditions which enter into it we are not long in seeing that in the very nature of things no conclusion based on the several tests, as applied in the above case, is admissible, since in all surface waters, but especially in streams, there is an almost daily variation in their local conditions, dependent upon drought, or rains and floods on their branches and higher reaches.

There are local rains washing into the streams, surface refuse recently accumulated and of dangerous character, or the dissemination from old sources of pollution, as sewers, recent materials having in them specific poisons, which may develop in any river stream, and may suddenly give to previously inoffensive waters most fatal qualities. If engineers, chemists and bacteriologists were engaged daily with their various indicators in measuring these changes of quality, and were they supplied with efficient means for correcting defects, then we might fairly conclude that with such regulators a river water supply would be safe. Such an ideal state has, however, not been reached; and as executive officers we are bound to enquire more specifically into the matter, and to determine what attitude with our present attainments, we as sanitarians can best assume, and in what direction we must direct our energies.

1. EVIDENCES OF POLLUTION BASED UPON STATISTICS OF DISEASE.

So general seems to be the opinion that cholera in its native haunts is conveyed by river water, and so universal the evidence of malaria being borne along in river waters from lagoons and shallow banks where organic vegetable matter accumulates and decomposes, that I shall not deal further with them. The case which interests most of us, and which may be said to be the crucial test of water pollution in temperate climates is that of the dissemination of typhoid fever.

I do not propose to take up time in discussing the statistics of typhoid in all those cities north of the Ohio, situated on rivers below sewage outfalls and strike an average and settle the question for or against sewage pollution of river water from the evidence of an increase of typhoid deaths—(though I am certain a strong argument could thus be built up and probably will be by others on this discussion); but I shall take what seems to me a more difficult case as a test, viz: evidence from statistics that pollution of immense bodies of cold lake water, and of several river waters in cold weather is not only possible, but that it does take place.

The accompanying diagram illustrates the first point, viz: that bays of great lake water, in itself the type of pure water both from the chemical, biological and experimental standpoint, are not only capable of becoming polluted, but in the instances given is also actually polluted to

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the point of being comparatively measured by death-rates great in comparison with those cities supplied with the same waters but from points where at present contamination cannot take place.

The following are illustrative of the second point:

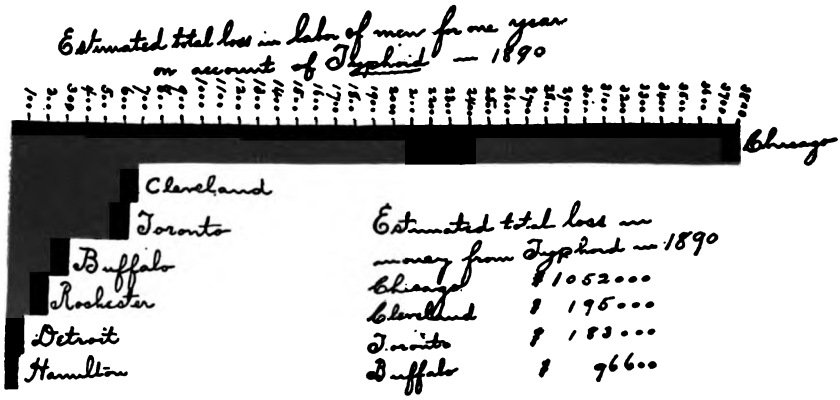
(a) The provincial asylum at Kingston, Ontario, is supplied with water from a pipe laid into a bay of Lake Ontario at a point where a creek brings down vegetable matter.

The superintendent who for years has had the same experience except that in recent years the use of a Hyatt filter has lessened the outbreaks somewhat, yearly expects that toward the end of January a fever will break out amongst the inmates—which for lack of a better he calls vegetable typhoid.

(b) During the autumn of 1887 the Ottawa river, a river only second to the St. Lawrence in size, and having its head waters on the watershed to the south of Hudson Bay, was the occasion of disseminating a fever, commonly considered typhoid, in November, which in six weeks had caused 1,500 cases, or had affected one-fifth of the total population between the susceptible ages of fifteen and thirty years.

(c) An outbreak, known as the Plymouth outbreak occurred in Pennsylvania in March, 1888, the particulars of which are known to all.

(d) A curious outbreak, whose details have been given by Dr. Vaughan of Ann Arbor, who made biological experiments with the water, took place at Sault Ste Marie on the United States side during the summer of 1890, although the waters of this as the other great lakes, seldom rises, except along the shores, to a temperature above 45° Fah. even in late summer.



As the presumed cause of this outbreak, a number of vessels had been temporarily, for a week or so, anchored near the town intake pike in Lake Superior, owing to break in the canal.

I do not deem it necessary to enter into local details; but need only say that in every case, as Chicago, Cleveland, Toronto, etc., the intake

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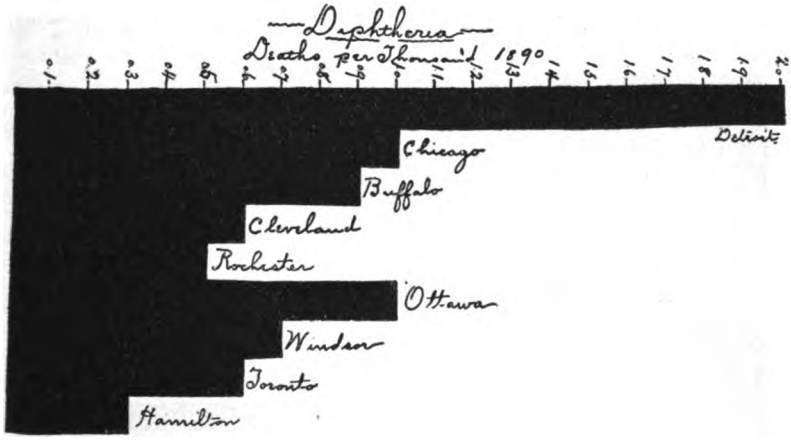
pipe is in water fifty feet deep at least; hence in very cold water, and while in at least the Toronto instance, the pollution may have been taken in through leaks in the pipe in the bottom of the bay, we have positive evidence from comparative statistics, that no matter how great dilution may be, if sewage can by winds or currents reach the intake-pipe, it will show its presence in the death-rate if typhoid germs exist in such sewage.

The following, I believe, will be found to be a law, viz: "That taking a series of years, the pollution of even relatively immense bodies of lake water, which having no regular flow, are liable to carry sewage to a water intake, will, at certain seasons, and with winds moving sewage towards the point of supply, cause outbreaks of typhoid of a more or less epi-



demic character." I further believe that we can establish from the foregoing diagrams another law, viz: "That in cities obtaining practically all their drinking-water from a public supply whose source is beyond the possibility of contamination, typhoid fever will practically disappear from the list of causes of mortality."

2. Causes and Conditions of Pollution of Streams.

What I have just stated as being what I believe will prove two laws regarding pollution of streams applies of course to the great source, which as sanitarians, we are so directly interested in, viz: sewage.

But there are several other other causes or sources which play an important part in this pollution, and which vary notably both as regards different streams, and at different points in the course of the same streams. Referring to the first it is manifest that a mountain stream issuing from the foot of some glacier, or as a spring flowing as underground water from clefts in the rocks, or appearing on the hill side from some water-bearing sand on the top of impermeable clay, and flowing thence in channels cut through rocky beds or layers of clay, will not

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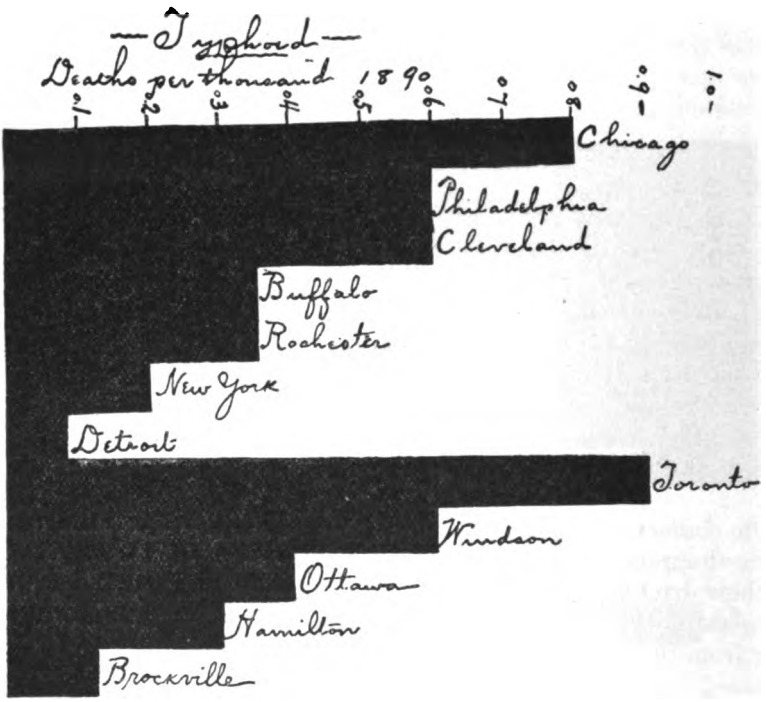
bear down either in suspension or solution any notable amount of vegetable organic matter. As, however, these or other streams speed on their courses to the plain they not only keep constantly receiving soakage from swamps and forest vegetable detritus; but they are constantly washing in some districts alluvium from their banks, and where they pass through cultivated regions tend to receive more and more the surface washings from manured fields, barn yards, etc., and direct pollution from cattle and other animals which have access to them. Owing to the constantly changing character of the bed along many streams it is, however, common experience that the waters of such show at different points,



varying amounts of vegetable pollution. We are aware, for instance, how the moorland water of the highlands of Scotland, the lake district of England, the Adirondack and Laurentian regions of the United States and Canada, have always presented in analysis an amount of vegetable pollution enormously greater than is often found in other rivers which are looked upon with suspicion as sources of public water supplies.

Take for comparison an analysis of the water of great lakes, as in the St. Lawrence and of the Ottawa, whose different waters flow along side each other, the blue of the one distinguishing it for miles from the reddish hue of the other.

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Analyses of water in Lake St. Louis. This lake receives both rivers, but the waters do not mix for miles.

Lake St. Louis, Ottawa River Water.

Total solids.	Loss on ignition.	Albuminoid ammonia.	Free ammonia.	Chlorine.	Oxygen in 4 hrs.	Oxygen in 15 min.
72	32	0.238	0.030	1.00	5.688	3.128

Lake St. Louis, St. Lawrence River Water.

Total solids.	Loss on ignition.	Albuminoid ammonia.	Ammonia free.	Chlorine.	Oxygen in 4 hrs.	Oxygen in 15 min.
128	48	0.130	0.014	350	1.280	0.628

Manifestly, therefore, other very different elements enter into the problem than that of excess of vegetable organic matter. Speaking generally from the sanitary standpoint those streams possessing frequently excessive amounts of vegetable organic matter of a humic character have come to be recognized as in themselves wholesome, and to be placed in northern latitudes in a very different category from any other streams, showing much less impurity of this kind. As illustrations I give the analyses of three different waters. The first is from an inland river taken from under the ice in February, the river flowing from a lake of considerable extent with swamp along its borders.

Analyses of Scugog Water Above Lindsay.

	In parts per million.
Free ammonia,	0.72
Albuminoid ammonia,	0.38
Chlorine,	6.00

The second is from an artesian boring through blue clay to a water-bearing sand above Hamilton Shale. It is used as a public water supply.

	In parts per million.
Free ammonia,	0.40
Albuminoid,	0.80
Chlorine,	202.0

The third is Chicago public water supply after a week of southwesterly winds, the river being two feet higher than the lake·

	In parts per million.
Free ammonia,	0.011
Albuminoid ammonia,	0.088
Chlorine,	1.888

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The analyst of the latter water states that the water supply is taken from a point two miles from the shore line. The albuminoid ammonia in water taken from the crib seems no greater than in water taken several miles further out.

Such waters, however, frequently present different characteristics, quite apart from the question of sewage contamination dependent upon the amount and nature of the inorganic sediment which they contain. As this varies from arenaceous to cretaceous, or to argillaceous, we find very different degrees of precipitation of this vegetable organic matter, clay precipitating with comparatively great slowness.

The well known differences are illustrated in the enormous settling basins which cities using such waters as the Missouri require, if the water is to be freed from its inorganic character; or in the artificial aid to sedimentation, now made use of by water companies, using artificial filters. But these river waters having high amounts of vegetable matter, possess therein elements which, while harmless in themselves, may become the condition whereby most extended outbreaks of fever may result. Deposited in lagoons, they may become with the retreating water subject to decomposition in the summer, and, being borne down by the next freshet, become the occasion of malarias and dysenteries of the most serious character. But what is yet more common in our northern cities is that at some point or other in their course they receive specific typhoid contamination from sewage. I have in mind such a case as that of the Ottawa in 1887. A water-race had been blasted from the rock for about half a mile along the river bank to obtain power to drive the engines. Along the bottom of this race was laid the wooden conduit into the river above. During the investigation into the outbreak, the committee of the Provincial Board, learning of the suddenness and general dissemination of the fever throughout the city, at once concluded the outbreak was due to typhoid.

The engineers and many local medical men laughed at the idea of the majestic Ottawa carrying typhoid. When, however, the conduit was examined the next year the following condition, as stated in the engineer's report, was found:

"I had it examined by a diver who reported a large number of small holes in the pipe, and he cut out two small pieces of the wooden staves which showed that they had been eaten or worn away from some cause which I could not then determine; in order to be doubly sure, I employed another diver and he reported the pipe in a very bad state throughout its entire length. He took out more pieces of staves which were even in a worse state than the first. I then had the inlet to clear water pipe closed tightly and found that the pumps ran for over an hour without any perceptible change in the guage level, thereby clearly showing that the water pumped into the city was drawn direct from the aqueduct and not as intended from the inlet of clear water pipe."

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The Lowell and Lawrence outbreak in Massachusetts in 1890, is a similar instance, although the pollution, especially of the Lawrence water, had for years given these towns an unenviable notoriety in the matter of typhoid prevalence. The following extract from the annual report of the Massachusetts State Board of Health, for 1890, well illustrates this point of the results of sewage pollution:

"These are the only two cities in the State which draw their water for drinking purposes from a river, into which, within twenty miles above, sewage is publicly discharged. * * * * The amount of sewage that has directly entered the river and its branches during the chemical examinations of the past three years, is estimated to be about one gallon in six hundred of the river water passing Lawrence, and there has been no more impurity in the water that could be detected by chemical analysis than in about one-half of the drinking water supplies of the State obtained from ponds and streams. But the facts which have been presented, showing that these two cities have so much higher death-rate from typhoid fever than any other cities of the State, together with what is known of the relation of typhoid fever to sewage polluted drinking water, are the strongest grounds for concluding that even with the smallest amount of organic impurity in the water, as shown by chemical analysis, the disease germs of this disease are able to pass, and do pass, from one city to the other in the waters of this river."

The details of an outbreak in the cities along the valley of the Tees, in Yorkshire, England, which occurred in August and September, in 1890, are so admirably set forth in the report for 1891 of the Local Government Board of Great Britain, that I cannot forbear referring to them.

The outbreak began in August, 1890, a great increase in the typhoid cases for the fortnight, ending September 20, being noticed, which increase continued till October 4. In four weeks 570 cases occurred in 550 houses. In all the area, made up of some thirteen registration districts, there was a total population of 520,000, near all of whom were supplied with water passed to subsidence tanks thence through sand filter-beds from the Tees. It was supplied by two water companies, their intakes being but a few score yards apart at a point two miles above Darlington at Broken Scaur. The amount of water daily pumped was about 11,000,000 gallons.

During the four weeks the exceptional prevalence was limited to the areas so supplied, 41,000 houses being supplied by the companies, 6,000 were supplied from other sources. The rate of excess was calculated by the house, there being twelve cases per 1,000 in those supplied by the city and less than one per 1,000 in houses supplied from other sources.

What was remarkable was that several hamlets along the river above, getting water out of the river, but not from the water company, escaped.

Above the source of supply the drainage area of the river covers three

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hundred square miles and the water flowing past the pumping station in times of drought amounts to 45,000,000 gallons. Over this drainage area are scattered 15,000 persons in numerous villages and farm houses. Some fifteen to twenty villages up to Barnard Castle are situated along the river. The nearest is half a mile above the intake pipe, thirty-three houses whose drainage runs into an old cess-pool with an overwash during rains into the river. The next town is two and a half miles up the river with sixty houses, and the next six miles up with 170 houses. The sewage from the last has its watery portion flowing over into the river, the rest drying alongside of a ditch which is washed out with floods.

The next town is seven miles up, and the next is ten miles, with 300 houses polluting a branch of the Tees. At fifteen miles above is a town of 1,000 houses.

The heaviest rain fall in the valley during the period occurred in the fortnight ending August 23d. The river was in flood on the 13th, also on the 23d.

The rainfall of the 23d is exactly parallel with the incubation period of typhoid, which preceded this general diffusion. The town authorities have for years recognized the liability of the river to severe pollution, which occurs during flood time. In 1887 analyses were made biologically and chemically, the report of which states "That on a sudden rise of the river's flow, and for 48 hours after its onset, there is great increase of organic matter at the pumping station, and abundant evidence of unaltered sewage." "The filtering processes greatly reduce the amount of organic matter, but during high water the town water shows presence of organic pollution, which is in part composed of fresh unaltered."

None of the towns above suffered from any epidemic of typhoid during this period, although several isolated cases had appeared.

Dr. Barry concludes his report on this outbreak with the following conclusion: "That if the sewage and excremental and other refuse were kept out of the river, the danger of specific pollution would be greatly reduced, but even under these circumstances it is still doubtful whether a water pumped from a river at a point upwards of forty miles from its source, is anywhere in this country a desirable supply for drinking purposes."

From these and hundreds of other outbreaks which have been more or less closely studied, it must be apparent that the soundness of what I have laid down as a law of pollution can scarcely be questioned.

At this point we are, however, met with the sceptical inquiry, how, if what is here stated be true, does it happen that our towns are not decimated by constantly recurring outbreaks of typhoid? I shall therefore endeavor to set forth what appears to me to be the chief reasons.

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3. WHY POLLUTED STREAMS FAIL TO PRODUCE AT ALL TIMES OUTBREAKS OF TYPHOID.

Notwithstanding all that theory would lead us to infer with regard to the causes which lead to outbreaks of typhoid, it may here be said with perfect truth that there have been and are many local conditions, which, viewed generally, seem so bad as to inevitably cause outbreaks of typhoid, and yet which have failed so to do. Believing as I do, and as I believe most here do, in the production of the disease only by some one or more specific species of microbe, it becomes incumbent on us to endeavor to supply some rational explanation of these cases of local, temporary, or continued immunity from outbreaks of typhoid. I shall endeavor to give what appears to me to be some of the reasons, therefore in their natural order.

1. The temporary absence in the polluting sewage of some towns of the specific microbes from pre-existent cases. This may fairly be assumed from the facts frequently published, that when the excreta from cases have been known to obtain entrance into wells, into small streams, etc., they have seemed to be the occasion of outbreaks, where, with the same polluting conditions, few or no cases had previously appeared.

2. The much more frequent case, when although such microbes do reach streams supplying public water, the natural agencies inimical to their multiplication have preponderated. What they are is but partially known. By bacteriologists we are assured that water bacteria are hostile to the development of typhoid germs. From others we learn from their experiments, that while the diphtheria baccillus and the cholera bacillus are not soon affected by sunlight, yet the typhoid bacillus soon disappears if exposed in liquids to sunlight.

3. Another, and I believe, a most potent cause for their non-multiplication is temperature, and in this way, that with a warm temperature water bacteria are present in streams in incredible numbers, and do then very probably prevent the development of typhoid bacteria, and by presence of sunlight.

That there are temperature conditions, however, most favorable to the development of typhoid bacilli seems to me to be proven beyond all doubt by the history of what we often term typhoid wells. Probably every one of us is acquainted with one or more such wells, which as the later summer months come round cause local outbreaks of typhoid. In the north there are almost shallow wells fifteen or twenty-five feet deep or less. In such the normal water-temperature of say 55 F. slowly increases, the depth of water, and therewith the dilution of the filth in the well becomes less, and the annual outbreak of typhoid occurs. Here are increased pollution, increase of temperature and absence of light, the necessary elements for the development of the germs of the disease which have lain dormant in the well. In streams such conditions do not exist together with anything like the same frequency, and

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hence it is that in warm seasons it seems principally when floods, bearing down an increased pollution, or when drought by evaporation producing much the same conditions occur that river typhoid develops most freely.

4. To these conditions Pettenkofer and others with him add a most important agency in the abounding vegetable life of streams, which according to this author continue their purifying effects on the waters of German rivers even in winter. For two reasons this same infusorial life in the cold rivers and lakes (except small lakes and ponds) of the north, does not in winter seem to carry on its beneficent work as seen from the facts. First, that in our frozen rivers the vegetable organic materials present are at times in excess, sewage will flow unaltered for many miles under the ice; and second, because as seen in most notable instances, as in the Ottawa outbreak at Sarnia on the St. Clair river, as also a most serious outbreak at Plymouth, Pennsylvania, river epidemics of typhoid have occurred with the river water at winter temperatures.

5. Another and most potent element in the prevention of outbreaks is constantly more or less in operation, viz: sedimentation. Polluted swift flowing streams may really be more dangerous than sluggish ones. Buffalo sewage is readily detected in the Niagara river at the falls, and the river water at Fort Niagara at the mouth of the river shows some evidences of its presence. In so cold a stream decomposition by natural processes must of necessity, as in winter, be delayed, and sedimentation cannot well take place, enormous dilution being the special element of safety in this case.

In sluggish streams, with detritus from the banks of creeks and rivers, sedimentation in such water is enormous; but when in winter this does not greatly take place, the sewage may with whatever germs it contains be carried along to a public water supply unaltered, and being drunk with the water, produce as in instances cited, epidemic effects.

6. Of other accidental elements to prevent outbreaks is that of currents. Currents in streams as in lakes, although perfectly understood by fishermen and every amateur yachtsman and harbormaster, are to the engineer and scientist enigmas as difficult to understand as is the historic flea to catch. As popularly stated, "you put your hand on it and it isn't there."

This has been elaborately illustrated by the results of a series of float, temperature and bacteriological experiments carried on during the past summer in Lake Ontario along the Toronto water front. We had been told by some the currents set westward, by some eastward, and so on; but the results showed in every case that surface wind currents ultimately determined the direction of the deep water floats, that surface warm water was with certain strong winds drawn out into deep water by an undertow, and that these currents, if bearing sewage, would undoubtedly temporarily pollute the city water supply.

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These same surface wind currents will similarly to some extent affect every river current, and while it may be true that a water pipe laid in deep water in mid-stream will escape much surface sewage pollution, it is no guarantee that such will always and invariably continue to be the case. Indeed, in ponds and sluggish streams it has been shown by the Massachusetts Board experiments that the deeper waters are often most polluted. Hence while the pollution of a stream is such as to cause most positively deleterious effects, it will depend upon the relative location in the stream of the sewage current, and the current at the point whence the water is taken, whether the pollution will be much or little, constant or intermittent.

7. The last of the reasons I give here is that on which so much has been spoken and written, viz: artificial removal of pollution. Artificial purification of some kind or other has been too long practised for us as sanitarians to ignore its utility. In an article at the recent Water Works Association meeting in Brooklyn, on the Brooklyn water supply, the source of that wonderful underground supply and its freedom from contamination was set forth. There is exhibited the great natural system of intermittent downward filtration. It is nature's, and like everything that nature does if allowed her own time, it is perfect.

There is illustrated what is arrived at by water companies. They attempt it in various ways. The great London water companies have beds of sand, acres in extent, through which water is not allowed to pass by law faster than a certain rate per hour.* This method is manifestly crude as some days the clear river water may be well purified; at others this may be with increased pollution, imperfect. How imperfect such a filter may be is seen in the Tees epidemic referred to, and that related at the International Congress of Hygiene by Dr. Kummel of Altona, below Hamburg.

This system has been reduced to something more scientific at Berlin where the action of the filters is measured by the plate-cultures being daily purified by the officers in charge; but what kind of a check valve is put on I do not know; and of how great practical utility it can be I

* "The water supplied from the Thames to London is all submitted to the purification processes of subsidence and filtration, the filter beds of the different companies vary in detail, but are all constructed upon the same plan; for example the four filter beds of the West Middlesex Company (six acres in total area) at Barnes have a total thickness of filtering medium of five feet six inches, consisting of two feet three inches of Thames sand, one foot of Barnes sand, and two feet three inches of Thames sand, one foot of Barnes sand, and two feet three inches of gravel of various degrees of coarseness; beneath the filter beds there are collecting drains of six inches diameter; they are pierced and laid twenty feet apart.

Efficient filtration largely depends on the rate or flow of the water through the filtering medium. It is laid down as an accepted standard that the rate of filtration for the Metropolitan waters should not exceed 540 gallons per square yard of filter bed each twenty-four hours, or two gallons per square foot per hour. None of the London Companies at the present time infringe this rule and the filtration rate in practice is slower than the above."

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cannot readily conceive, since if floods brought down excessive impurities, and the degree of bacterial pollution would require at least twenty-four hours to be measured, the river might be clearing by the time special filter beds were brought into requisition. However, it is a positive advance in knowledge of the life-history of the Spree at that point. That the results are far from complete as seen in the plea raised by Pettenkofer and others for a Rivers Commission to be appointed by the German government to study in detail each river supply in relation to the towns supplied.

What sewage farming has already taught us in the old world and what Massachusett's experiments have recently demonstrated, indicate that along quite another line than that of mechanical filteration, it is possible to approach nature's method of intermittent filtration, which in my opinion is most economically carried out by letting nature measure the extent of ground required and then by our taking the filtered waters from their native-bed, as underground waters, where contamination is impossible.

Basins for sedimentation have in the past and must still in the future play an important part, but they are of necessity always a crude and imperfect method except at great expense.

During the past year I have had an opportunity of experimenting with an artificial filter under pressure, and have to state it as my belief that there are very great possibilities in store for this method.

At St. Thomas, Ontario, the water supply is obtained from Kettle Creek filters by means of a Hyatt Filter. The Hyatt system consists of the addition of a small quantity of alum for each gallon of water before filtration, thus clarifying it considerably by the formation of a precipitate. It is claimed that this precipitate in falling entangles and brings down with it the bacteria so that they are more easily removed by filtration. The filtration takes place through sand contained in large horizontal cylinders, provision being made for the reversal of the stream of water once in twenty-four hours so as to thoroughly cleanse the filters.

In St. Thomas there are two of these filters each with a filtering capacity of 500,000 gallons, and they are at present putting in an additional one.

The following are some of the results:

July, before filtration, 45,000 per c. c.; after filtration, 90 per c. c.

October 23d, before filtration, averaged, 240 per c. c.; after filtration, average, 44 per c. c.; pumping at rate of 1,324,800 gallons per twenty-four hours.

October 24, before filtration (10.30 a. m.), average, 1,380 per c. c.; after filtration (10.30); filter one, cleaned at midnight, 59 per c. c.; after filtration (10.30 a. m.); filter 2, cleaned at 10 a. m.; 270 per c. c.; after filtration, 11 a. m.; both filters together, 65 per c. c.; pumping at rate of 810,720 gallons in twenty-four hours.

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October 26, before filtration, 1,545 per c. c.; after filtration, 70 per c. c.; pumping at the rate of 794,880 gallons in twenty-four hours.

These results show a high degree of efficiency in the filters as in the case of the examination of October 23, the pumps were sending water through the filters at a rate about one-quarter as fast again as they should.

The reason why they do their work is perfectly easy to understand; but the work to be done increasing almost daily it is likely to be found in practice, as indeed with all artificial methods, that the filters will be forced to try and do more than they can perfectly and with success accomplish.

Having then at some length set forth;

1. Why the question of pollution of streams has so long been one of controversy.

2. Some of the evidences of pollution of streams, based upon statistics of disease.

3. Some of the causes and conditions of pollution of streams.

4. Why some polluted streams fail to produce at all times outbreaks of typhoid, we may very briefly endeavor to sum up the question which we started out with, viz:

What attitude with our present attainments must we as officers of public health assume in regard to the pollution of streams by municipal sewage and in what direction must we especially direct our energies?

Doubtless for the present our action is limited on its executive side by the statutory enactments peculiar to each State or Province; but inasmuch as legislation is dependent ultimately upon the views we hold on these subjects it is always possible and necessary that we exercise on municipal authorities an influence which will materially aid in obtaining general enactments which will govern the disposal of sewage generally.

It is quite apparent that the density of population as it varies in different States and in the same State with increasing years of settlement is the element, which more even than preconceived scientific opinion forces upon the public, and thereafter the legislature the discussion of what constitutes pollution, and of what measures are to be adopted for preventing or regulating existing pollution. It would be most fortunate, however, if new States and Provinces just entering upon the work of city-making should copy such legislation as has been forced upon older States by increasing population; since the many questions of vested municipal rights, and the interests of riparian owners could at such a time be adjusted in a way which at a future date may be found impossible without costly litigation.

The considerations already presented make apparent the fact that we need not expect to set down conclusions off-hand as regards details, which would be either universally applicable, or accepted on all hands

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as correct. To illustrate this I quote one or two expressions of opinion by prominent sanitarians. Dr. Barry has stated that in his opinion "It is doubtful whether in England any river forty miles from its source can be considered a safe source of public water supply," and yet the Government Official Water Examiner state that more than fifty per cent. of the water supply of Great London is taken from the Thames, and that as long ago as 1885 the sewage of over 70,000 people was delivered directly into the river at points above the intake.

As already stated, Pettenkofer and others with him have concluded that Munich may be allowed with safety to drain into the Isar, "without any hygienic disadvantages to the inhabitants."

This opinion seems to have been based upon the following experiments: Water was taken at Thalkerchen, a point on the river above Munich, and also at Treysing below the city. The water showed precisely the same qualities. He adds, however, "of course the natural chemical quality of any given water, as also the character of the river bed, its vegetation and strength of current, would play an important part in the work of purification. Simple chemical, physical and biological influences must all be considered."

Dr. Kummel, of Altona, holds, however, views strongly opposed to this. At the London Congress he related the details of an epidemic of typhoid at Altona, which city takes its public supply from the Elbe after a careful filtration. The city is situated below Hamburg. It appears that the latter city takes its water from the river without filtering, and with comparative safety.

Without multiplying opinions as to the natural purification of streams, which chemical analysis shows goes on in many streams owing to processes already referred to, I quote as bearing upon the point, the words of Fred. P. Stearns, engineer to the Massachusetts State Board of Health in a section treating on the various amounts of different constituents of domestic sewage added to a stream per 1,000 of population.

"With larger volumes (of water) the pollution (from 2.5 to 7.0 cubic feet per second per 1,000 persons) is so small as to be clearly admissible from the standpoint of the offensiveness of the water." Then he adds: "In a stream used for domestic water supply it cannot be said, with our present knowledge, that any degree of dilution will make the water entirely safe for use."

Whatever views, therefore, may be held on the various points coming up for consideration in connection with the disposal of the sewage of any individual municipality, the following three general propositions will, I have no doubt, meet with general acceptance:

1. That, as is stated in "An act to protect the purity of inland waters," passed by the Legislature of Massachusetts, 1888, "The State Board of Health shall have the general oversight and care of all inland waters." * * * "It shall recommend measures for the pollution of such waters,

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and for the removal of substances and causes of every kind which may be liable to cause pollution thereof," or as stated in the public health act of Ontario: "Whenever the establishment of a public water supply or system of sewerage shall be contemplated by the council of any city, town or village, it shall be the duty of the said council to place itself in communication with the provincial board of health, and to submit to the said board, before their adoption, all plans in connection with the said system.

"It shall be the duty of the provincial board of health to report whether, in its opinion, the said system is calculated to meet the sanitary requirements of the inhabitants and of the said municipality; whether any of its provisions are likely to prove prejudicial to the health of any of the said inhabitants, together with any suggestions which it may deem advisable: and to cause copies of the said report to be transmitted to the minister of the department to which the said provincial board of health is attached, and to the clerk of the municipal council, and the secretary of the local board of health of the district interested.

"No sewer, or appliance for the ventilation of the same, shall be constructed in violation of any of the principles laid down by the provincial board of health, subject to appeal to the lieutenant governor in council."

2. That those municipalities situated within the same drainage area, where streams, polluted with sewage from one municipality become or are likely to become sources of public water supply for other municipalities, be by law united by an order in council to the Governor upon the report of a State or provincial board into a rivers conservancy board, said board to act in conjunction with the state or provincial board in the consideration of town water supplies and sewage disposal within the area.

3. That in cases where rivers, lakes, etc., form interstate, interprovincial, or international boundaries or where the course of such passes from one State or province into another, that interstate or interprovincial action be encouraged; and that in those cases where streams come within the control of a federal government, that such government should urge interested States and provinces to similarly appoint conservancy boards.

Amongst other conclusions, which I believe the facts warrant us in drawing, but upon which there may be differences of opinion, are the following:

1. That no water into which sewage flows can at all times and under all circumstances be considered safe for domestic supplies.

2. That there are streams and lakes, such as the Great Lakes, of such enormous volume that it is as yet possible to pour sewage into them and yet use their water for public supply; but that this can only be done in those cases where such distance intervenes as shall allow time for the

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natural purification of water to have completed itself and that this can only be known after careful and extended experiments, chemical, biological and bacteriological, in addition to currents and temperatures, carried out in different seasons and under the varied conditions of flood and drought, etc.

3. That where ordinary streams in well settled districts are required to be used for public purposes owing to the lack of other source of supply, that every effort be made by boards of health to have the gathering grounds and sources of supply kept free from all forms of animal pollution; and hence would urge that modern methods of sewage disposal, notably those of intermittent filtration, or precipitation with subsequent filtration, be forced upon the attention of cities and towns contemplating having sewerage works.

4. That few river waters are fitted for use without sedimentation, and filtration either by natural sand filters, or some mechanical filter, as those through sand operated under pressure.

Drs. Cochran, Thompson, C. A. Lindsley, Vaughn and Walcott, discussed the questions presented in short speeches sustaining the views presented by Drs. Lee and Bryce.

On motion of Dr. McCormack the questions were referred to a committee composed of Drs. Vaughn, Walcott and Bryce, with instructions to make a report during the afternoon session.

Adjourned to meet at 2.30 p. m.

SECOND SESSION.

The President announced as the first order of business the reception of the report of the committee on the pollution of streams, and the formation of Rivers Conservancy Commission, Dr. Salomon, chairman of the committee submitted the following:

MR. PRESIDENT AND GENTLEMEN OF THE CONFERENCE: Your committee to whom was referred the duty to consider "the best means of securing the formation of rivers conservancy commissions, composed of State and local boards of health, and to recommend such legislation as may be necessary to secure the desired result; and also to consider and report upon the sanitary value, especially to municipalities of the purification of water in polluted streams, either by the distance which such polluted water has travelled or by means of filters or storage beds or by other artificial means," beg to submit the following report:

As was fully exposed in the discussion at the last conference the difficulty of obtaining concerted and uniform action preventing the pollution of streams is apparent. While one State may adopt effective sumptuary laws, a contiguous State whose waters are the source of pollution of onflowing streams traversing other States may be without such legislation and as then shown, the control of the matter is beyond the jurisdiction of the State afflicted.

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The formation of Rivers Conservancy Commissions naturally suggested itself as the best means of securing the desired end, said commissions to be composed of representatives from Boards of Health of adjoining States. But we are at the onset met with a serious obstacle in the way of accomplishment of effectual work by the fact that even after the formation of such commissions and the adoption of suitable plans of co-operation, the proper legislation by individual State Legislatures will be required to make the plans effective. By those who are familiar with State legislation it will be easily comprehended what difficulties are to be met in securing uniform laws by all the States under which joint commissions can act; and the opinion is therefore expressed, that owing to this cause and the unavoidable delays to be met in securing such legislation even if favorable to the object in view, and consistent with all the requirements, the establishment of such commissions as suggested is considered impracticable.

Under the auspices of this conference, whose principal aim is to secure co-operation of State Boards of Health in all matters pertaining to public health, uniform and concerted action on the part of State Boards would be easily accomplished, provided the necessary laws existed, but when we are confronted with the fact that under existing circumstances in most of the States special legislation will be required, the drawbacks already mentioned will be readily appreciated.

What then is to be done? Your committee believes that the proper remedy lies in national legislation.

As the General Government has recognized the importance of and has assumed, the control of all navigable streams for commercial purposes, it is equally as important and necessary that it should exercise control over streams for sanitary purposes.

It has been demonstrated that legislation by an individual State has no effect in preventing the pollution of streams within its own borders through agencies in other States which are entirely beyond its control.

Therefore, the necessity for legislation by the general government, whereby practical and certain results can be attained, appears to your committee to be the only solution of the difficulty with which we are confronted.

Purification of water in polluted streams by the distance which such polluted water has travelled is a matter of such uncertainty that we may pass by this portion of our subject without serious consideration; for except in rare instances, such as the lower Mississippi river, and possibly a few other streams, the constantly recurring sources of contamination are so frequent as to preclude purification by oxidation or the action of infusoria.

Even in the water of the Mississippi river at New Orleans, which is probably less contaminated from sewage than any other stream in the thickly populated portion of the United States, we find the appearance

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of albuminoidal material in such quantities as to render the water at least suspicious from a sanitary standpoint.

It is generally conceded, and has been an accepted basis of computation that water containing an excess 0.10 to 0.15 parts of albuminoidal nitrogen in 100,000 parts of water is unfit for use for drinking purposes. While such waters may not produce disease, they are still looked upon as dangerous to health, and their use is generally condemned.

An analysis of Mississippi river water at New Orleans made by Professor A. L. Metz, chemist of the Board of Health, shows the following results, expressed in parts per 100,000:

	Unfiltered Water.
Free ammonia,	0, 016
Albuminoid ammonia,	0, 020
Nitrites,	none.
Nitrates,	0, 20

	Filtered Water.
Free ammonia,	0, 009
Albuminoid ammonia,	0, 0025
Nitrites,	none.
Nitrates,	0,020

In giving the result of this analysis we have omitted inorganic matters as having no bearing on the subject.

The figures are such as to demonstrate that unfiltered Mississippi water at a point far removed from sources of contamination, where every condition exists for its purification by the distance travelled, is nevertheless to be regarded as not the best for drinking purposes.

This illustration alone is sufficient to show that distance travelled is a small factor in the purification of polluted water.

This being the case in the particular water mentioned our belief is strengthened in the unreliability of nature's forces in this respect when applied to streams, whose sources of pollution greatly exceed the one under consideration.

This being admitted, attention must then be directed to artificial means, either mechanical or chemical, for furnishing pure potable water and leads to the inquiry as to the best methods of purification, and the fact that this inquiry has been deemed of importance as a part of the proceedings of this conference, and also that many of our health authorities are engaged in laborious and expensive experimentation, notably in the State of Massachusetts i sufficient evidence that an efficient and economical method of purifying waters for domestic uses is imperatively demanded, for it must be borne in mind while pursuing our investigations that both requirements are absolutely necessary to the end in view; that is, economy combined with efficiency.

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While it may be an easy and comparatively a not costly undertaking to deliver pure water to the citizens of towns situated on rivers whose only contamination is the clay or sediment which they carry in suspension, it is an entirely different matter when the water to be dealt with is such as is found in the Merrimac or other streams filled with pollution from factory waste, sewage, etc.

The treatment of sewage before being delivered into streams so as to render it innocuous naturally suggested itself as the prime factor in our efforts at water purification; but that is a question which is considered not strictly within the scope of the present report. As your Committee understands it, the object of our inquiry is in reference to water which being polluted should be rendered fit for human use before being delivered to the consumer.

The extensive, careful and elaborate scientific experiments which are being carried on by the Massachusetts Board of Health first claim our attention.

Without entering into details with which all are familiar, through the exhaustive reports made upon this subject it is only necessary to quote from said report to demonstrate what has already been accomplished and what is now being done. The main object of the work mentioned is to ascertain if filtration will accomplish the object in view; and, it has undoubtedly been demonstrated that for waters polluted with sewage, intermittent filtration affords results which have been entirely satisfactory.

To quote from the report:

"Filter tank No. 8.

"This large tank in the field filled with fine gravel and coarse and fine sand, with a layer of loam eight inches deep, having its upper surface six inches below the top of the filter has continued through the year (1890) to filter 1,500 gallons of city water applied daily on six days of the week. This is the equivalent of three hundred thousand gallons daily per acre for six days in the week."

This filter has been filtering city water constantly for three years, giving an entirely colorless effluent. The total quantity filtered is the equivalent of 206,000,000 gallons an acre.

The average analysis of the effluent for the year 1890 to the end of November is as follows:

Free ammonia, ... 0, 007, or 41 per cent. of applied water.
Albuminoid ammonia, . . . 0, 0056, or 45 per cent. of applied water.
Nitrates, ... 0, 0239, or 134 per cent. of applied water.
Nitrites, ... none.
Chlorine, ... 0, 17.

"Number of bacteria per cubic centimer, 56, or 47 per cent. of the number found in the applied water."

After giving details of analyses by months the report goes on to say:

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"The most of the water, was during the day, about three hours passing through the sand and this time has been sufficient for satisfactory nitrification to take place.

"The free ammonia of the effluent has been sixty-eight per cent. of that of the applied water, and the albuminoid ammonia has been reduced to 51 per cent. of that of the applied water.

"The great reduction of the organic nitrogen, as shown by the albuminoid ammonia and the conversion of this into nitrates is the important step in purification."

This single example will show that the experiments in filtration now being pursued by Massachusetts are deserving of the careful study of sanitarians, and although the work is still in progress, and no definite final results have yet been claimed, there is no doubt that the desired end will soon be attained, and when published will fully answer satisfactorily the question as to the purification of the class of waters under consideration, and furnish information as to the best method for adoption by other health authorities and communities in their endeavors to furnish pure potable water.

For a full exposition of this subject your Committee refers the members of the conference to the "Report of the State Board of Health of Massachusetts, 1890, on the Purification of Sewage and Water."

Attention is also directed to the admirable work accomplished at Davenport, Iowa, in mechanical filtration, where there is a filter plant with a capacity of 7,500,000 gallons per twenty-four hours, which has been erected at a cost of $100,000, and which is operated at an annual cost of about $10,000 in addition to the cost of operating the waterworks system. (See monthly bulletin, Iowa State Board of Health, March, 1892.)

A method of filtration to which attention is now being particularly directed is the Revolving Purifier Process, or as it is frequently called "The Anderson Process," the principle of which consists in the production of an intimate contact between metallic iron and the liquid to be purified by the showering down of finely divided particles of the metal through an onward flowing stream of the liquid

The action of this process is twofold, chemical and mechanical and is thus described:

"On issuing from the purifier, the water or sewage under treatment is charged with a soluble ferrous salt which immediately begins to change into the insoluble ferric oxide by the process of oxidation due to its contact with the air. The rapidity with which this precipitate forms varies considerably according to the nature of the liquid being purified.

"In the case of waters of the Mississippi, Missouri and Ohio rivers, which contain large quantities of clay mud, much of which is in such a finely divided condition as to seem to be permanently dissolved, the effect of agitation with scrap iron is to produce in the space of a few

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minutes a coarse flocculent precipitate which settles rapidly, leaving clear colorless water after a few hours sedimentation."

"Waters of this nature are especially easy to treat by the 'Anderson' process, and the rapidity with which the clay is coagulated renders the process extremely economical. The cost of purifying water of this description at Dortrecht in Holland, is only $1.10 per million gallons."

After treatment by this process, it of course remains to separate the precipitate before the water can be used for domestic purposes.

This is easily accomplished in settling basins and by filtration through sand.

Henry Leffmann, of Philadelphia, in a paper read before the American Waterworks Association, speaking of the Anderson process, says:

"The advantages of the Anderson process over the other methods of purification are among others:

"1. The avoidance of the use of chemicals.

"Scientifically utilized, metallic iron, by its mere contact with impure water, produces by the help of the ingredients in the water the salt necessary to produce purification. Natural oxidation causes this salt to act as a coagulant, and further the action of ferric oxide or rust in its nascent state furnishes the power of destroying organic matter.

"2. The automatic and continuous renewal of the active surface of the iron.

"By means o. the revolving purifier system the various forms previously recognized as efficient purifiers of water can be utilized without incurring the mechanical difficulties resulting from their use in filters which become choked up and caked after a short time.

"Owing to the completeness of the contact between the iron and water and the large surface of metal exposed, purification is effected in a space of time of three and one-half to five minutes for moderately bad water, and in five to fifteen minutes for sewage effluents.

"3. The removal of micro-organisms to such an extent that the water as delivered is practically sterile.

"This extraordinary fact is conclusively proved by the experiment made at Antwerp by Prof. Van Ermengen on samples drawn at frequent intervals from the delivery pipes of the sand filters when supplying over 2,000,000 gallons per day. The 100,000 microbe colonies contained in a cubic centimeter of the Nethe water are reduced to an average of five colonies, which considering the great difficulty of avoiding all contact with the air in these delicate tests, is equivalent to a complete destruction of the micro-organisms."

Repeated experiments on all classes of waters have apparently demonstrated satisfactorily results obtained by this process. It then only remains to ascertain the cost of its use on a large scale and to determine whether its economy warrants its employment.

Official inquiry through the Belgian consul at New Orleans brought the following reply:

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"It is yet difficult to estimate the exact cost of using the Anderson purificators. Up to date it has been very small. The motive power required to turn the apparatus is trifling. The cost of cleansing is really nothing, from the fact that the particles of iron are kept clean by reciprocal frictions. All oxidized matters are removed by the current of water and deposited on the sand filter. The quantity of iron used does not exceed one-tenth of a grain per gallon or about fifteen pounds per million gallons.

"The filings of cast iron that can be employed for the purification would cost perhaps ten shillings per ton, making the cost of iron employed amount to about three quarters penny per million gallons.

"The cost of cleansing the sand filters averages twelve shillings per million of filtered gallons, including the cost of the purified water used to wash the sand.

"In our works at Waelhem we have established three Anderson purificators No. 10, which can together purify 2,200,000 gallons of water per day. The value of these machines is 1,350 pounds sterling, and the cost of their installation, including the building in which they are located, was about 300 pounds. The water retains no trace of iron after being filtered through sand. The daily consumption of water at Antwerp at this time of the year (July) is about 2,000,000 gallons, and it is all subjected to this process of iron purification."

From the foregoing it will be observed that the cost is remarkably low and constitutes a very small item in the question of obtaining pure water, and if it can be successfully applied to the waters of the Nethe at Antwerp, which are not only very turbid but also highly contaminated with organic matter, this process is entitled to our attentive consideration.

The "Spencer" and "Hyatt" systems, in which clarification is based upon the use of iron as a coagulant, are also worthy of consideration, but your committee have no data of extensive operations upon municipal or large water supplies upon which to base conclusions.

Filter plants operated under these and other methods controlled by "The New York Filter Company" have been established in a number of cities for purifying the public water supply, the largest being probably that at Chattanooga, Tennessee, under the process known as the "National" with a capacity of 4,000,000 gallons per twenty-four hours.

While reports from several of these plants are favorable as to the result obtained, the information as to the cost of plant and of operating same is meagre and furnishes no basis of conclusions as to their economy upon a very extensive scale.

In this connection it may be very interesting to state that the New Orleans Water Works Company has just entered into a contract for a plant under patents controlled by "The New York Filter Company" with a capacity of 20,000,000 gallons per day with little or no material loss of pressure. The result of this work will be awaited with interest.

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The investigations as to the use of iron as a purifier, made by Mr. L. H. Gardener, superintendent of the water works at New Orleans, will be of interest. Extracts from his report on this subject follow·

"Looking to quick results and entire success in the object of purification I am persuaded that the use of iron in some form is the true agency. It is difficult for one to read the experiences and opinions of those whose mission is to study the subject without concluding that filtration, on any scale, however extended, is but a system of straining, and that it has never fully answered to desired results, this, whether the desired object be the elimination of sediment or of *algae*, of *spores*, or of general organic impurities or defilement.

"For a very large or public supply it seems scarcely necessary to say that if prompt and economical results can be secured in reservoirs or tanks by defensible chemical precipitation or clarification, filters are not needed. The chemical clarification of water is not a new proposition. It has been used, with various agencies, for centuries. The methods and agents have varied with the surrounding conditions, just as have the supposed adaption of herbs and other natural remedial agents for the cure of disease.

"Among the agents (other than iron) thus used may be mentioned lime, alum, borax, oxalate of potassa, and the now unknown vegetable processes of the ancients along the banks of the Nile and elsewhere.

"To these may be added the use, under special circumstances, of permanganate of potash.

"After experimenting with all the known agents, I express my preference for iron. I am also convinced that a solution of iron is of easier mechanical application to water, and by its fluid adaptability is subject to such control as the character and treatment of the water may demand. This graduated application will in intelligent hands obviate the necessity for subsequent filtration. The only trouble would seem to lie in the direction of the cost of the solution.

"The salts of iron have hitherto been made only upon a limited scale and for medicinal purposes. Their production in such a manner, or after such a formula, would, of course, be too expensive, if not prohibitory, for the purpose suggested. If, however, red hematite iron ore be employed, and treated simply with hydrochloric acid, bringing it to say 50° B., or to say 1.50 specific gravity, the solution suggested can be made in large quantities at a very low cost.

"With such a solution I conducted a series of experiments of a minor and preliminary character. I verified them in the reservoirs of the New Orleans Water Works. The water thus clarified was analyzed with entirely favorable results by Professor Chandler, of New York, and by Professors R. N. Girling and Joseph Jones, of New Orleans.

"Later I verified the result upon the largest scale permissible in the United States, viz: In the settling basins at St. Louis.

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"In August, 1884, by the courtesy of Colonel T. J. Whitman, C. E., water commissioner of St. Louis, and aided by Mr. William Golding, M. E., of New Orleans, I clarified a body of 13,000,000 gallons. The result was in every way prompt and satisfactory.

"The solution used in the demonstration, the water in various stages of precipitation, and the colorless resultant water were all subjected to chemical analysis, and with unqualifiedly favorable reports. The action is partly chemical and partly mechanical.

"In the water of the Mississippi there exist carbonates of lime and magnesia. Contact with the chlorine in the iron solution forms chloride of calcium, and coincident therewith is the formation of hydrated oxide of iron. This latter settles rapidly, carrying with it all suspended matters, leaving the water clear. The use of a solution of 1.60 specific gravity in the proportion of one part in 20,000 clarifies the muddiest water, and neither hardens the water nor leaves any trace of the iron therein. A smaller amount may be used successfully.

"The waters of the Mississippi river at New Orleans can be rendered crystal clear by the process described, with a rest of say eight hours in reservoir, at a maximum running cost of one cent per 1,000 gallons. The cost will be less if a longer period of rest be allowed.

"It will also be decreased if the clarifying material be manufactured by the water company or department. The cost of a plant for its manufacture will not be large.

"After many experiments, and on several waters, which I confess were to a large extent empirical, I am convinced that iron is the agent of all agents to which we must resort for the cure of most, if not all, of the evils of which our communities now complain, in connection with their domestic water supply. If surroundings will permit its economical addition, let the quantity of iron be reduced and the feature of aeration be added and perfect results could not be avoided in treating any water supply.

"In reference to the removal of organic matter by this agency, Nicholls, in speaking of the Antwerp process says (Nicholls on Water Supply, p. 173): "Although . . . . . it is difficult or impossible to obtain a water free from iron, there is no doubt that a considerable portion of the dissolved organic matter is removed, and it is claimed that the bacteria and bacterial germs are completely removed. These claims are borne out by the experimental investigations of Bischof, Hatton and others, and give to the material a great theoretical advantage."

With the exception of the filter beds established at Lawrence by the State Board of Health of Massachusetts, already referred to, and which are now on an experimental scale only, we have no reports of satisfactory results by this method of purification, and it remains to be seen whether the Lawrence results will prove equally as satisfactory and be at the same time economical on a large scale.

At Poughkeepsie, N. Y., filtering beds with 29,000 square feet of sur-

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face were established at a cost of $54,000, and the cost of maintenance amounts to about $3.00 per million gallons, not allowing for interest on the plant or the cost of pumping; altogether a too expensive system for general adoption.

Taking into consideration the interest on the plant and the cost of maintenance, irrespective of the cost of pumping, it has been estimated that the cost of the filter bed system would amount to about $11,000 per million gallons, and this estimate has been generally accepted as correct by careful investigators interested in the subject.

Commenting upon this, Mr. L. H. Gardner pertinently says: "Several cities in the United States have filtering beds or filtering galleries; and while the literature on water supply alludes to them in respectful terms, the success of their systems in the desired direction does not appear to be generally commended by any writer, in any respect or from any point of view. There is a singular and almost total absence of information as to the cost of maintenance."

Your Committee, therefore, in respect to this portion of the duty assigned, begs to submit the following conclusion:

That while recognizing the importance and magnitude of the subject under consideration, and while sensible of the necessity from a sanitary point of view of providing pure water for domestic purposes, it is unable to report finally upon the practicability from an economic standpoint of filter beds for the water supply of large cities, but would await further results of the experiments now being carried on by Massachusetts, and, while believing that the results obtained meet fully all the requirements, the question still remains as to whether the cost and maintenance of filter beds will warrant their general adoption on an extensive scale.

As to the use of iron as a coagulant and oxidizing agent, the results seem to warrant the recommendation of purification by this method without recommending any particular process.

Settling basins may and probably do answer every sanitary requirement where the water from streams only contains inorganic matter in suspension. But as most of the streams from which our water supplies are derived are contaminated with matters seriously dangerous to the public health, and as this evil is constantly growing more threatening, and the waters are becoming everywhere more and more polluted with sewage, factory refuse, etc., the matter of settling basins does not come within the purview of our serious consideration.

Finally, your Committee recommends that all State Boards of Health be solicited to give the matter of pure water supply their most earnest consideration, and after careful inquiry as to the needs of the particular locality within the jurisdiction of each, urge upon the civic authorities the necessity for the adoption of such measures as shall guarantee to its citizens water free from impurities dangerous to public health.

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The importance of legislation in this regard, as a factor in preventing illness and death, cannot be too strongly insisted upon.

Respectfully submitted.

LUCIEN F. SALOMON, M. D.,
Chairman.
C. A. LINDSLEY, M. D.
C. N. METCALF. M. D.

On motion of Dr. Bryce the committee that just made its report was instructed to meet and act with the committee appointed at the morning session, and said joint committee make a report before the final adjournment of the conference.

The next topic discussed was the one proposed by the State Board of Health of Connecticut.

(a.) What is the most practicable way of providing a hospital for contagious diseases for a town or community of a population of 5,000, the same to be always ready for the reception of patients?

(b.) What will be the average cost of maintaining it, per annum; the probable number of patients it would be called upon to receive being regarded in the estimate?

Dr. Lindsley, of Connecticut, said: It was not my purpose in proposing this subject for consideration to-day to make an opportunity for presenting my own views upon it.

Indeed, I did not expect to be present at this meeting. But I look upon this question as one of great importance, and as one which in the early future must find a solution in some practical way.

The prompt notification of the presence of contagious diseases, and the ready and satisfactory means of isolating such diseases, are the most essential elements in any known means of restricting epidemics. I know that the topic is not a new one, but on the other hand is one which has arrested the thoughtful consideration of every active health officer in the land, and I hope by bringing it to the attention of this body of sanitarians, something pertinent to the necessities of the public would be presented.

The simple plan for an isolated hospital which I am about to submit to you will, I trust, afford a target for criticism and an incentive to suggestion from some of you which will develope a method more efficient and more practical.

Every local board of health realizes at times the great desirableness of a place where a patient with a contagious disease could be well taken care of, and so isolated that he would not be a source of danger to others.

To provide such a place seems beset with many and great difficulties. To build and equip a hospital for such a purpose, with nurses and other necessary attendants, always in readiness to receive patients, is thought beyond the financial ability of all small towns. It would appear to be equally impracticable for a number of neighboring towns, to unite in

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providing such a hospital for common use, for that implies for many of the patients too long a distance for transportation.

Now let us clearly understand what is the real use of an isolation hospital. Is it, as many think, chiefly useful to care for patients in an epidemic of contagious disease? No. That is not its best or most important use. An isolation hospital serves its highest purpose as a preventive of epidemics. How? Simply by caring for the first case in a community. Contagious diseases only spread by contagion.

If the first case of any contagious disease is so guarded that others are not exposed to it, there can be no epidemic. But with every additional case which occurs, the difficulties of preventing still further contagion, are multiplied. Hence to prevent an epidemic it is only necessary to keep the first case from communicating the disease to others.

That is the best work which an isolation hospital can do, viz: affording the place and means of taking proper care, in all respects, of the first case of any contagious disease which may appear in any village or town.

Hospitals are usually large buildings, imposing, costly structures.

An isolation hospital need not be a large building. Any good common-sized house, with two or three well ventilated rooms in the upper part, in a salubrious location, sufficiently remote from other houses to involve no danger to their occupants, affords all that is needful in the way of building. A little stock of ordinary medicines, and a good stock of approved disinfectants, and an abundant supply of bed linen, towels, etc., and some special furniture and appliances, which any good medical man could suggest, are all that would be needed in the way of equipment.

To provide such a place of refuge for a person with a contagious disease, is not beyond the easy ability of any town in the Union.

In most towns, a house which would satisfactorily serve the purpose could be found, which could be bought or rented. Or better, select the site and build for the purpose specially. Next, find a reputable family of adult persons, of not more than two or three in number, one of whom shall be a man, all of good habits, steady and trustworthy people. Give them the rent of the house free. Contract with them to receive and nurse, under the direction of the physician, what patients the Board of Health may send them, at a stipulated price.

In this way it is quite practicable for any town or village, to have a hospital for contagious diseases at an inconsiderable cost, which would be saved to the people ten-fold, with every first case of contagious disease it cared for.

Above all things do not call it a "pest" house. Do not damn it with a name which will shock the sensibilities of those who may need to go to it. Call it a "retreat" a "temporary home," or by any name which will not excite disagreeable associations.

Dr. De. Vaux said while he thought the suggestions made by Dr.

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Lindsley were practical he was of the opinion that it was necessary to have legislation on the subject, and from recent correspondence with Canadian physicians, he was satisfied that they had the very best laws. Dr. Lachapelle explained the methods employed in the Provinces of Canada.

Dr. Munn thought the subject brought up the relation of State Boards of Health to municipal boards, and he believed it to be the principal duty of the State Board to constantly urge the local boards to do their duty, especially when contagious diseases make their appearance in a locality. He believed in the establishment of hospitals for the treatment of these diseases; but that they should not be called pest houses, but instead, should be called by their proper names, contagious disease hospitals, for the people have an idea that if any one is taken to a pest house he is sure to die.

Dr. Thompson said that this subject had been discussed time and again. It was impracticable, and in this day and age, there is not a legislature in the Union that would pass a law compelling a mother to send or take her child affected with scarlet fever or diphtheria to a hospital of such a character. If you have a hospital for diphtheria you must have one for scarlet fever, and all the other contagious diseases. He considered small-pox one of the easiest things imaginable to manage, but when it comes to typhoid fever it was an entirely different affair and a difficult disease to control.

Dr. Baker did not know but what it was true just as Dr. Cochran said to him, that it was a local question. He considered the management of diphtheria in the northern part of our country one of the greatest importance. It was not small-pox that we wished to consider, we know how to manage that, but how to manage these other diseases that kill us, are the ones we wish to deal with. We must have these isolation hospitals in this northern country in order to effectually control them. Dr. Walcott this morning said that the water question was the most important one that would come before this conference. Water pollution meant typhoid fever. The chart which he exhibited showed that the deaths from diphtheria and scarlet fever doubled the number of deaths from typhoid fever.

Dr. C. A. Lindsley said he was in an isolation hospital in New York city last week, in which diphtheria and scarlet fever were received under the same roof; where they were separated only by the partitions between the rooms.

Dr. Emmert said this subject had been well discussed, but there was a social side to the question.

He would not dare go back to his State and advocate such a measure. The people were not sufficiently educated on the subject. You cannot take a child from its mother and send it to a hospital,

The people would not submit to such a procedure. As a scientific

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proposition he believed it was all right, as he believed in limiting the foci as much as possible.

Dr. Walcott said that in the city of Boston they had such a hospital which at times has been crowded.

Dr. Lachapelle believed that the sick from these diseases should not be forced to go to such hospitals, but it should be left optional with the people.

Dr. DeVaux announced that his State would support the proposition.

Dr. Wingate spoke as follows:

I do not understand that this resolution implies obligation but is simply a recommendation, and I sincerely hope it will be adopted by this conference. I think it would be an exceedingly unfortunate step to reject such a resolution after it has been presented to this body. Efforts are being made all over this country, by health officers and others, to establish these hospitals, and the friends of these measures are looking anxiously to the acts of this body for support and encouragement, and if this conference of representative sanitarians from the different States rejects a resolution simply recommending that such hospitals be established it would be unfortunate indeed.

In regard to the remarks made to the effect that sending people to a "pest house" in this age is a relic of barbarism, I desire to say that that may be so, for the time has come, with our knowledge of the management of contagious diseases, when we have no more use for the "pest house," but we need hospitals and there is no reason why an isolation hospital cannot be made as agreeable a place for one sick with a contagious disease as any hospital or home, and I think it savors more of barbarism not to care for these cases in hospitals properly constructed and managed than to let them expose the public and endanger the lives of others.

In my own city I am trying to remove the word "pest house" from the minds of the people and to establish a hospital where people will not have to be taken by force when ill with a contagious disease, but where they will be anxious to go, and I am succeeding very well.

In regard to its being an "outrage" to place people ill with different contagious diseases in the same hospital, I will say that we have treated two or three different diseases at the same time in our hospital, and in no danger to each other. They were, of course, treated in different wards, and the wards are specially arranged for caring for such cases, and I maintain that there is no more danger in treating such cases in that way under modern management of such hospitals and with trained nurses, than in treating them in separate buildings, and instead of its being "an outrage," it is the ideal way of treating and preventing the spread of all forms of contagious diseases.

For these reasons, Mr. President, I am most heartily in favor of the adoption of the resolution.

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The following resolution was presented and unanimously adopted.

Resolved, That it is the opinion of this conference that in all localities where diphtheria, scarlet fever and small-pox are liable to occur, hospitals should be always kept in readiness where patients with these diseases can be cared for.

The next question considered was The Michigan Plan of Sanitary Conventions. Professor Delos Fall presented the following paper on the subject.

SANITARY CONVENTIONS.

The influences which finally led up to the establishment of the Michigan State Board of Health had a beginning somewhere in the brain and heart of some liberal minded citizen, one whose broad and sympathetic spirit caused him to plan large things for his race. Preventive medicine was very little thought of in those days. The physicians' duties were comprised in the one line of curing the sick rather than preventing them from becoming so. Sickness is the inevitable lot of man they said and the physician is needed to ease the pain and restore to health, or if perchance it be that last sickness which is unto death, his ministrations would make easier the dying hours.

This was the creed of less than a generation ago. But some one thought differently and that some one influenced others until finally, by petition and memorial, by personal influence with legislators, and in other ways, in 1873, the law was passed which established the Michigan State Board of Health.

Section two of the act establishing the board defined its duties, provided for the election of a secretary and executive officer and defined his duties.

Prior to this, however, the work which such a board ought to do had been defined by the man who became its first secretary and who we are glad to say still serves us with signal ability. He had already been engaged in public health work, and as Superintendent of Vital Statistics has commenced the work of gathering, tabulating and preserving the statistics of sickness for the State. He had been a soldier and as such had been observant of the great destruction of human life by the ravages of war. Returning to the life of a civilian and having been brought face to face with deaths doings, with the ravages of disease, and at the same time possessing a true scientific instinct by which he quickly connected cause and effect, he declared that "grander victories, of greater importance to the people, remain to be achieved than any which have heretofore resulted from warlike methods. To the peaceful hero who shall call forth and so marshal facts and generalize the scattered forces of knowledge as to lead to a victory over any one of the prominent causes of death which now annually destroy our citizens by hundreds or by thousands, humanity may well accord a higher praise than to the most successful of warlike generals."

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Section two of the act establishing the board says, "The State Board of Health shall have the general supervision of the interests of the health and life of the citizens of this State. They shall especially study the vital statistics of this State, and endeavor to make intelligent and profitable use of the collected records of deaths and of sickness among the people; they shall make sanitary investigations and inquiries respecting the causes of disease, and especially the epidemics; the causes of mortality, and the effects of localities, employments, conditions, ingesta, habits, and circumstances on the health of the people. They shall, when required or when they deem it best, advise officers of the government, or other State Boards, in regard to the location, drainage, water supply, disposal of excreta, heating and ventilating of any public institution or building."

Section five of the same law defines the duties of the Secretary and among other things it requires that "he shall collect information concerning vital statistics, knowledge respecting diseases, and all useful information on the subject of hygiene, and through an annual report, and otherwise, as the Board may direct, shall disseminate such information among the people" The simple phrase "and otherwise," is perhaps the only sanction which that act gives to the holding of sanitary conventions.

The first recorded address made before the Board is worthy of repetition here as showing how early the members grasped the true idea of the nature of their work and the best methods of carrying it out. Dr. Homer O. Hitchcock was temporary chairman of the first meeting of the Board held in Lansing, July 30, 1873. He gave a short introductory address outling the prospective labors of the board. Among other things he declared the work of the Board to be "the making a State Board of Health popular with, because useful to the people of the State; to educate the people in respect to the nature and causation of diseases and the means for their prevention." "We must be ready," he said, "to point out the influences of the topography, geology, and climate of the various parts of our State upon the health of its citizens; the importance and intimate relation of drainage and sewerage to the health of families and whole communities; to call the attention of the people to the influence of various kinds of occupations, food, drink, and clothing, as well as the structure of their public and private buildings, upon the development of certain forms of disease; and most especially to point out the vast importance to the welfare and the perpetuity of the State, of properly rearing, training, and educating the young, and to point out the nature and causes of epidemics, endemics, and contagious diseases, and the means for their prevention or eradication."

The work of the Board was therefore of a two-fold nature, viz: (1) to collect information and (2) to disseminate it among the people.

To this line of work the Board has held itself steadfast during the almost nineteen years of its existence.

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How may the people best be reached, how shall the information gathered by the Board be brought before their attention? These questions have received various answers. At first the Board sought to do its work by sending out circulars and their annual reports.

They were sent largely to health officers and not directly to the people. These circulars were very emphatic in their utterances, one, for example, sent out in 1874, contained specific directions for the restriction and prevention of small-pox. In the same circular are these words: "Scarlet fever is a contagious or infectious disease, and as such, requires the same means of prevention as small-pox (except vaccination), including 'isolation of the infected person, absolute quarantine of the household or hospital where the diseased person is lying, cleanliness, ventilation,' and all the methods of disinfection hereinafter enumerated, in connection with the disinfection of the excreta from the infected, the disinfection of clothing, bedding, furniture and rooms, and also fumigation. When scarlet fever exists in a community the preventive means should be applied with the same energy and perseverance as is done during the prevalence of small-pox."

The circular further said: "The number of deaths in Michigan during the year 1870 from small-pox were nine (9); from scarlet fever, eight hundred and fifty-two (852). If it is worth while to attempt to decrease the number of deaths from small-pox below nine (9) a year, is it not an imperative duty to reduce the number of deaths from scarlet fever from 852 a year to a number that will, in a measure, approximate that of deaths from other contagious and infectious diseases?" Average death-rate from 1878 to 1889 inclusive, was 386, in 1889, 240.

But these circulars did not reach the people, and if they did they lost much of their forcefulness. The influence exerted and the interest aroused by them could not be compared to that produced by the uttering of the same truth directly to the people by word of mouth.

This thought seems to have been the inspiration which came to our veteran sanitarian, Professor R. C. Kedzie. In his annual address for 1878, as President of the State Board of Health, he proposed the holding of sanitary conventions in different parts of the State, to consider and discuss sanitary matters. A committee was immediately appointed to consider the best means of inaugurating such sanitary conventions.

It was thought best that each of the conventions should be held by the joint action of the State Board of Health and a committee of citizens of the place where the convention should meet.

At the April (1879) meeting the Board voted to hold two such meetings, the first in the city of Detroit, and the second in the city of Grand Rapids, on condition that the people of the places named would defray the local expenses of the conventions, also that certain influential gentlemen should be invited to take part in the way of addresses and papers, and that manufacturers and dealers in sanitary appliances be invited at

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their own expense to forward their goods for exhibition. It may be said that the latter feature was carried out and a number of sanitary appliances were exhibited and reported upon.

It was soon discontinued, however, probably because those dealing in these articles made an unfair use of any good words which the Board or prominent sanitarians might say of them by way of advertising.

These two conventions were held, and proved to be very successful. As Dr. C. C. Yemans, secretary of the Detroit convention, said in his official report, "all in attendance were well pleased with the session of the first sanitary convention, and regarded the work done as equal to the anticipations of its most enthusiastic friends."

Thirty-seven such conventions have been held in different parts of the State. The accompanying map shows how thoroughly the State has been covered by these meetings. From the first meeting held in the metropolis and the second held in the second city, the convention has gone into place after place, nearly all principal places having been visited, as well as many smaller ones. Our audiences are almost always large, and always enthusiastic. The people are eager to learn and ready to practice when they have been convinced of the best way of producing sanitary reforms. That great good has been accomplished there can be no doubt. In a number of cases the convention has been followed by improvements in the water supply, water works have been built, sewer systems established, better methods of disposing of waste and excreta have been adopted, a better support given to the health officers, nuisances have been abated and many other public reforms have been the legitimate outcome of a sanitary convention. Added to these public benefits are those coming to the hundreds of households who have heeded a personal appeal made to them and have entered upon reforms in domestic sanitation which have been productive of great good.

The writer of this paper considers that his task has been accomplished when he has told in the briefest way the method of procedure by which one of these conventions is planned and carried out.

The various steps in the process are given in the order which characterizes the conduct of every convention. First, then, the initial step is never taken by the State Board of Health. That is taken by some person of the place, who, for one reason or other, thinks it desirable that a convention should be held there. That person interests the public in the project enough to obtain the signatures of prominent citizens, the mayor and council, the clergy, members of the medical fraternity, lawyers, teachers and others to a petition to the State Board, asking that a convention be held. Some of these petitions merely recite the desire to have the convention, others give the reasons.

One city asks it because an epidemic of diphtheria is prevailing; another because of a poor water supply causing typhoid fever; another because the common council have abolished themselves by formally

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abolishing the local board of health, etc. One appeal will be given in full.

This petition shows one feature that is unique, viz: it is the only one the expenses of which have been borne by the citizens of the place.

This convention was held in compliance with an invitation from the mayor and council and citizens of Iron Mountain, as follows:

IRON MOUNTAIN, MICH., *October 6, 1891.*

HENRY B. BAKER, M. D.,

Secretary State Board of Health, Lansing, Mich.:

DEAR SIR: We have been having a rate of death in this city from typhoid fever that is simply awful. This sickness has become so serious that the city council recognized the fact that something had to be done to get the State Board of Health to come here immediately.

And on last Monday night they appropriated the sum of $250 to defray the expenses of your Board. As the cold weather sets in so early here it would be advisable for the Board to come immediately.

Rev. A. E. Cook, who has written to you in regard to this matter, will forward you the necessary petition, and as the city council will defray your expenses, I know and hope you will do everything in your power to help us in this matter.

Please come immediately and assist to save the lives of the balance of the citizens.

Yours truly,

F. J. TRUDELL,

Mayor.

Memorial from Citizens of Iron Mountain for a Sanitary Convention

IRON MOUNTAIN, MICH., *October 2, 1891.*

To the Honorable the State Board of Health, Lansing, Mich.:

GENTLEMEN: The undersigned citizens of Iron Mountain, Mich., believing that the public discussion of questions relating to the public health, under the auspices of the State Board of Health, would result in great benefit to our city, hereby respectfully petition that a sanitary convention may be held in Iron Mountain, under the direction and with the co-operation of your Board or a committee thereof, at such date prior to November 14th as you may be pleased to select.

Signed by thirty-five citizens.

These invitations are accepted by the Board and as far as is practicable the conventions are held in order in which the invitations have been received. A committee of the Board is appointed to visit the place and confer with a like committee of the citizens, which in the meantime has been appointed at a public meeting held for that purpose.

At the joint meeting of these committees all the details of the convention are worked out, the time of holding the convention, number of sessions, place of meeting, subjects to be discussed, etc.

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The permanent officers of the convention are chosen, a president, a number of vice presidents, a secretary, an executive committee, reception committee, and music committee. At this same meeting persons are chosen to prepare papers upon the subjects assigned. Usually the papers are prepared by local persons enlisting for this purpose those prominent in all walks in life, lawyers, physicians, teachers, preachers, editors, engineers, politicians. Some one is also appointed to lead in the discussion which follows, very often some member of the State Board. Sometimes this order is reversed, a member of the State Board preparing the paper and some one else leading the discussion.

And now if the convention is to prove a success much preliminary work must be done and for this the Secretary will be largely responsible. That he will be a good man for this work has been considered before he was appointed to this office. The State Board prints preliminary notices and the same number of envelopes with the date of the convention and the Secretary's name printed upon them. With these the Board also sends five dollars worth of postage. These notices are sent by the Secretary to prominent people in the adjacent cities and towns, and in many cases a personal letter is written giving a special invitation to attend. The Secretary follows up the persons appointed to prepare papers; he looks after the music committee; he sees that the executive committee does it work, leasing the hall for the convention, etc.; he inserts notices in all the papers of his own and surrounding towns; in short he is instant in season and out of season to see that no part of the work is neglected. Care should also be exercised in the choice of a person for the president of the convention, one who will be familiar with the proper proceeding of a deliberative body and who will see that the program is carried out promptly, and unnecessary and tedious discussions cut off. When the time draws near the program is formally made out and is printed by the State Board

The members of this conference are all doubtless familiar with these programs, if not they can be supplied with sample copies. What may be called the evolution of the convention program is an interesting study. The early programs contained such subjects as forests and trees as sanitary factors, training schools of cookery, cosmetics, Texas cattle disease, etc. These are good subjects, but they do not bear directly on those conditions by which lives are lost, they are a long way subordinate to the study of the restriction and prevention of dangerous communicable diseases. To do justice to that first program, however, it ought to be stated that it contained one paper on "The Limitation of Pulmonary Consumption," which in the light of recent advances concerning that disease seems almost prophetic, and a paper in the second program on "General Sanitation, Its Importance to the Public Welfare and a Plea for Better Methods," was in many respects far in advance of the time for which it is written. Our later conventions, however, have

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been given largely to the education of the people regarding the germs of disease, how they are studied, how they develope, how diseases are communicated, how managed, restricted, prevented. The discussion of the water supply for example has for its purpose to show the relation which that water may have to certain micro-organisms, which are capable of living in it and producing disease. A proper system of sewerage is urged because it diminishes the chances for the spread of disease germs. The proper disposal of waste and excreta is discussed because in these forms of decaying organic matter is recognized one of the most dangerous possibilities of the spread of a communicable disease In discussing the abatement of nuisances in general our plan is always to call attention to the fact that the greatest nuisances, the ones most to be dreaded, those which must be removed at whatever cost of time or trouble, are those forms of infected matter which are capable of producing disease and death.

In a word the program turns about a center composed of those communicable diseases which are the causes of the greatest mortality.

The sessions of the convention are four or five in number. The first one is usually at 2 or 3 o'clock in the afternoon, a second in the evening of the same day. If the number of papers to be presented and the interest of the people warrant it, a session is held in the forenoon of the second day. If not, a session is held in the afternoon and a closing session in the evening.

Of course it must necessarily be, in these efforts to secure the co-operation of the general public in sanitary matters, that all scientific nomenclature is dispensed with and while the truth is accurately told it is clothed in popular language, the language of the people rather than that of the scientist. As one has put it, "here statistics become charged with the enthusiasm of the speaker, the inattentive become attentive and the blind begin to see." Following the presentation and discussion of a special subject, the circulars issued by the State Board bearing on that subject are distributed among the audience and when the proceedings are published several hundred copies of the entire convention number are sent to be distributed among those interested.

As a layman, I may be permitted right here to record my high appreciation of the hearty support given these conventions by the resident members of the medical fraternity. They have been foremost in the work of bringing about reforms which are designed to reduce sickness and death to the minimum. Self-interest, the duty which compels all to look after one's own interest is a "first law of nature" and physicians are not exempt from it, but in the majority of cases they are the pioneers in the work of reform; they are the educators through whose teachings the people learn the art of preventing disease and prolonging life. On the other hand the convention has not been without its reflex influence on the physicians themselves.

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They appear more largely than any other class on the programs and the people hear, for the first time, their own family physician it may be, uttering sentiments which are convincing truths to them that he is governed in his practice by the principles of preventive medicine rather than a mere desire to cure from sickness. Their confidence in him is thereby strengthened and his practice benefited accordingly.

Concerning the publication of the papers presented at these conventions it should be said that they are carefully edited before being published, all errors are corrected as far as possible, all irrelevant matter pruned out, etc. A rule very early adopted by the Board is strictly adhered to. It is as follows:

Resolved, That no papers shall be published in the annual report of this Board except such as are ordered or approved for purposes of such publication by a majority of the members of the Board; and that any such paper shall be published over the signature of the writer, who is entitled to the credit of its production as well as responsible for the statement of facts and opinions expressed therein.

At the present time it is usual to print two thousand copies of the proceedings.

The aggregate of printing done for the thirty-seven conventions has included about 55,500 announcements and invitations, 66,600 programs and 74,000 copies of the proceedings; that is at the average rate of 1,500 announcements, 1,800 programs and 2,000 proceedings for each convention.

What does a sanitary convention cost? The answer given to that question depends upon how thorough you make the work of instruction of the people. The mere expense of holding the convention is comparatively small but if the proceedings are publised for distribution among the people the expense is doubled. The plan followed by our board is as follows: The citizens of the place in which the convention is held provide a hall in which to hold the meeting, pay expenses of heating, lighting, janitor, etc., pay any necessary expenses for local advertising, for music and the like. They do not generally entertain the members of the board who attend. The board assumes the expenses of the members, hotel and traveling; the printing of invitations, programs and proceedings, postage for the secretary, etc.

The following schedule shows in detail the expenses incurred by the four conventions held in the year 1890. Those held in Alpena and Charlevoix were in distant parts of the State, making the traveling expenses of members correspondingly heavy.

Expenditures on account of the four sanitary conventions, held under the auspices of the Michigan State Board of Health, during the calendar year 1890:

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COST ON ACCOUNT OF THE LAPEER CONVENTION.

Printing announcements and ruling note,	$4 03
Printing programs,	6 23
Composition and press work on proceedings,	59 10
Correction on the same,	1 80
Covers for the proceedings,	4 80
Folding, stitching and covering,	6 00
Postage to the secretary of the convention,	5 00
Reprint No. 333 (making over form, presswork, binding),	1 70
Reprint No. 334 (making over form, presswork, binding),	1 80
Reprint No. 335 (making over form, presswork, binding),	3 60
Reprint No. 336 (making over form, presswork, binding),	1 35
Covers to reprint No. 334,	30
Printing envelopes for use of secretary of convention,	45
A. A. Clark, expenses,	7 51
John Avery, M. D.,	12 31
H. F. Lyster, M. D.,	5 50
Delos Fall, M. S.,	14 45
H. B. Baker, M. D. (expenses in making arrangements),	5 01
H. B. Baker, M. D. (expenses in attending the convention),	7 96
Postage for announcements sent out,	6 55
Postage for programs sent out,	6 16
Envelopes used sending announcements and programs,	2 03
	$163 64

COST ON ACCOUNT OF THE ALPENA CONVENTION.

Printing announcements, ruling note,	$2 93
Printing programs,	5 75
Printing envelopes for use of secretary of convention,	45
Composition and presswork on proceedings,	63 91
Correction of the proof of the proceedings,	4 80
Covers for the proceedings,	4 80
Folding, stitching, binding proceedings,	6 00
Reprint No. 343 (making over form, presswork, binding),	1 90
Reprint No. 344 (making over form, presswork, binding),	1 50
Reprint No. 345 (making over form, presswork, binding),	1 50
Reprint No. 346 (making over form, presswork, binding),	1 70
Postage for secretary of convention,	5 00
A. A. Clark, expenses,	21 75
H. F. Lyster,	25 00
Delos Fall,	25 50
H. B. Baker (making arrangements),	17 22
H. B. Baker (attending the convention),	21 50
Postage for announcements sent out,	6 30

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Postage for programs sent out,	6 40
Envelopes used in sending out programs and announcements,	2 03
	$225 94

COST ON ACCOUNT OF THE BATTLE CREEK CONVENTION.

Printing announcements, ruling note,	$2 68
Printing programs,	6 95
Printing envelopes for use of secretary of convention,	45
Composition and press work of proceedings,	45 08
Covers to proceedings,	4 80
Folding and stitching, covering proceedings,	6 00
Reprint No. 337 (making over form, press work, binding),	1 55
Reprint No. 339 (making over form, press work, binding),	1 55
Reprint No. 340 (making over form, press work, binding),	1 70
Reprint No. 341 (making over form, press work, binding),	1 70
Postage for secretary of convention,	5 00
A. A. Clark (expenses),	6 95
John Avery,	11 00
H. F. Lyster,	12 40
Delos Fall,	3 50
H. B. Baker (attending the convention),	8 72
Postage on programs sent out,	6 25
Postage on announcements sent out,	5 20
Envelopes used in sending out programs and announcements,	1 83
	$133 31

COST ON ACCOUNT OF THE CHARLEVOIX CONVENTION.

Printing announcements, ruling note,	$2 98
Printing programs,	6 25
Printing envelopes for use by secretary of convention,	45
Composition and press work on proceedings,	36 31
Cover for the proceedings,	4 80
Folding, stitching, covering proceedings,	6 20
Reprint No. 349 (making over form, press work, binding),	1 70
Reprint No. 350 (making over form, press work, binding),	1 35
Postage for secretary of convention,	5 00
John Avery,	20 50
Arthur Hazelwood,	23 95
J. H. Kellogg,	17 90
V. C. Vaughan,	24 60
H. B. Baker (making arrangements),	17 23
H. B. Baker (attending the convention),	20 05

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Postage for programs sent out,	7 00
Postage for announcements sent out,	6 75
Envelopes used in sending out programs and announcements,	2 20
Charlevoix,	$205 22
Battle Creek,	$133 31
Alpena,	225 94
Lapeer,	163 64
Average,	182 03

It remains to make mention of the part taken by the members of the State Board of Health in these conventions, very much of their success is due to the loyal support given them by all the members, often at a great sacrifice of time and labor. The Secretary has been present at every session of every convention, and four or five of the members have also been in attendance at each convention.

A study of the programs shows that the names of members appear either for papers, addresses or discussions in the aggregate 225 times or an average of over six such exercises for each meeting.

The announcement that at each session, a prominent sanitarian will be heard goes very far toward attracting large audiences and insuring a successful meeting.

I will say in closing that this paper has not been written with a view to defend the sanitary convention.

It needs no defense. Each one has been its own justification as the people are constantly testifying. It is a settled policy with our boards and the coming years will see the number of such conventions larger rather than smaller.

Drs. Thompson and Avery discussed the subject.

"What measures can be enforced to prevent the spread of infectious diseases in rural districts?" was the next question that demanded the attention of the Conference.

Discussion was opened by Dr. Beeve. Dr. C. A. Lindsley had nothing to add in regard to educating the people, but had something to say about health officers. In Connecticut they had a health officer in every town and all of them were not medical men. Frequently many of them did nothing, paying attention to their private business and allowing the public business to take care of itself.

In many cases the officers were not paid sufficient to cause them to give proper attention to the business of the office, and in many places they received no salary.

He believed it to be the duty of the health officer when the presence of a contagious disease came to his knowledge within his jurisdiction, to visit the affected premises and see that the patient is isolated, and not be satisfied by telling the people what to do.

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Dr. Walcott said in Massachusetts the State Board of Health had the authority from the quarantine from the port of Boston down to the smallest town in the State to interfere and take charge of an outbreak of contagious diseases where health officers were not doing their duty. The State Board, however, had no disposition to interfere where local boards were efficient.

Dr. Bryce found that where physicians were doing the work of health officers in the Province of Ontario without salary, such officers did more efficient work than those that were paid for their service. Their board had the power to appoint local health officers, and they had efficient and well organized boards in the rural districts.

Dr. Lachapelle thoroughly agreed with Drs. Walcott and Bryce.

Dr. Baker said to prevent the spread of these diseases it is necessary to have a knowledge of the first cases. In the case of infected immigrants we receive information of their destination from the Supervisor of United States Immigration in New York, and the health officers residing in the localities to which they are going are notified and the immigrant is kept under observation.

The next topic taken up for discussion was the part played in the spread of tuberculosis by the flesh and milk of tuberculous cattle.

Dr. Fisher who was down on the program to open the discussion sent the following communication and article:

PROVIDENCE, R. I, *May 31, 1892*

C. O. PROBST, M. D., *Secretary State Board of Health of Ohio:*

DEAR DOCTOR: Expecting great pleasure in meeting you at Lansing, I find myself at this near approach to the date of the meeting incapacitated physically for the journey. I am the victim of rheumatism and have frequent attacks, and have to dictate a considerable part of my work as at this time. I enclose some notes which I had made to assist the memory in the discussion assigned me. Pressing duties now crowding prevent me from filling in with remarks, but they may serve as points or propositions for starting a discussion.

Please excuse me at the conference and convey to my old friends, including yourself, the assurance of my continued remembrance and warm regard.

With great regret because of my inability to be present at the conference I remain,

Yours very truly,

CHARLES H. FISHER.

NOTES ON THE CAUSATION OF TUBERCULOSIS BY MEAT AND MILK.

That tuberculosis may be caused by the conveyance of the specific bacillus from an infected to one not so affected through the medium of meat and milk, is not now a question.

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That the part played by the question of milk. is by far the most important as a means of spreading the disease.

That the danger of infection from the use of milk, is the greatest when the udder is tuberculous; and otherwise in the direct ratio of amount of visceral and glandular invasion by the bacilli and tubercular growths; and when the recipients are in the earliest stage of life, and when in later years the vital forces are enfeebled.

That the direct infection of young animals by tuberculous milk, is generally, if not nearly always, first manifested in the abdominal viscera, and death not infrequently ensues before extension to the thoracic viscera is accomplished.

That it is doubtful if cows affected with tuberculosis have reached the age of five years and over without having previously shown symptoms of the disease, can be said to have derived the disease from tuberculous milk.

That much the largest number of tuberculous cows are over five years of age, and that the disease, in a majority of cases of that age and over, is largely confined to the costal pleura, the lungs and pericardium.

That not all, nor even a large proportion of the calves suckled by cows in some or any stage of tuberculosis, become tuberculous within two years, but that a large proportion of young pigs fed exclusively on milk from tuberculous cows do become tuberculous and show symptoms in from eight to ten weeks, and in some cases are badly affected in from ten to twelve weeks.

That it is probable that young children and even adults, becoming tuberculous through the medium of milk, are first affected in the abdominal viscera and that if the increase of the tuberculosis among bovine animals which is not doubted has caused a corresponding increase in human tuberculosis, that such increase has been most largely in disease of the abdominal viscera.

Taking the census years, 1870 and 1890, the percentage of increase of population in R. I. was about 40 per cent.

The proportion of increase of mortality, from pulmonary consumption during the same years, was about 40 per cent., the mortality from tubercular meningitis, less than 40 per cent., and the mortality from abdominal tuberculoses in excess of 100 per cent.

Doubtless some allowances should be made for more correct differential diagnosis during the later years.

If, as claimed by some parties, prominent veterinarians, the tubercular microbe may be expected to be presented in the milk of all tuberculous cows, and that from five to eight per cent of all milch cows are tuberculous, we would thereby be confronted with the appalling statement that from one twentieth to one twelfth of all the milk consumed by human beings, may carry the seeds of death.

The immense quantities of milk consumed and the probability of a

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considerable proportion (not nearly reaching the estimate above) conveying tubercular bacilli into the stomach of millions of people daily, calls for some suggestion as to why the cases of tuberculosis have not been immensely larger in number.

Speculative theories are not few. That there are, however, agencies within the body antagonistic to the multiplication and life of the specific microphyte, is scarcely to be questioned. Whether the agencies are some of the constituents or qualities of the digestive fluid or of the blood serum or of the muscular juices, or the leucocytes or other special phagocytes, newly created or increased in number, specially as a fighting police to resist the invading bacilli, or whether the bacilli, are sooner or later, forced to a combat with each and all the normal defenders either to conquor finally or be destroyed, although questions of great importance and eliciting large discussion, are still "subjudice."

The questions of the detection of tuberculosis by tuberculin or otherwise, of the arrest of progress within the body by sub-cutaneous injection or ingestion of inorganic substances, of the conferring of immunity from the effects of bacillary invasion, of the means of dislodgment and removal of the bacilli and their products from within the body and the repair of lesionsin non-immune invaded bodies, are pertinent in relation to effects or results of use of tuberculous milk, and may be considered if circumstances favor.

Some Observed Facts.

In connection with the consideration of tuberculosis in cattle, there are some facts that have come within the experience and observation of the Secretary that have an obvious bearing upon the question of the transmissibility of tuberculosis from one animal to another, and from cows to human beings by the ingestion of milk.

Within the last twelve years there have been found from one to two cases of tuberculosis in various herds in the State, without the occurrence of other cases subsequently in the same herd.

Within the same period there have also occurred in a very few instances only, the knowledge of the infection of the entire herd, and in no herd exceeding eight in number, except at the State Farm.

In no instance has a case of tuberculosis occurred in any family, ascertained by observation or inquiry, subsequently to the home use of the milk from any of the herds in which tuberculosis has been found.

In no instance has tuberculosis been found present in any family or in existence immediately proceeding the occurrence of the malady in the bovine stock of such family.

In no instance has there seemed to be any connection between the infection of tuberculous cattle and the sputum of any consumptive person.

The Secretary has under observation several persons who used exclusively, for not less than a year in either case, the milk of tuberculous

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cows which are badly diseased, and so far, now from two to three years, no cases of consumption have occurred among them.

These facts, however, do not disprove the theory of the communicability of tuberculosis, which the Secretary believes to be well established but do show that the dangers from infection are not so inevitable as some theorists are disposed to affirm.

It may be stated also that while tuberculosis has been gradually increasing among the milch cows of the State, the proportion of deaths from consumption or tuberculosis, among the human population of the State has been gradually decreasing.

The subject was further debated by Drs. Munn, Wingate and Emmert. Adjourned to meet at 7:30 p. m.

THIRD SESSION.

The special committee appointed at the first session reported as follows:

Report of the committee appointed to deal with proposition regarding the pollution of streams, and the purification of water supplies.

Mr. Chairman and members of the Conference:

GENTLEMEN: Your committee appointed to deal with the above matters begs to report.

First. That it is the opinion of your committee with regard to State action. That State and provincial authorities should interfere to prevent municipalities, corporations and individuals from polluting streams which are or may become sources of public water supply.

Second. That with regard to interstate and international action. That no practicable method for securing conjoined action presents itself to your committee.

Third. That it is the opinion of your committee that further consideration of practical methods for preventing pollution of rivers and streams and for the purification of water supplies is desirable.

All of which is respectfully submitted.

PETER H. BRYCE,
H. P. WALCOTT,
VICTOR C. VAUGHN,
LUCIEN F. SALOMON,
C. N. METCALF.

Dr. Cochran protested against the adoption of the report and the whole matter was referred back to the committee with instructions to report at the Annual Conference.

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The next question considered was: should State Boards of Health be charged with the administration of medical practice laws?

The discussion was opened by Dr. Baker who maintained that State Boards of Health should not be charged with the administration of such laws.

Dr. Cochran thought that the enforcement of laws regulating the practice of medicine might be accomplished by boards of health even if some members of such boards were not medical men; some State Boards being so constituted.

He had always maintained that the medical profession should have charge of the administration of laws regulating the practice; the same as the legal profession regulated the practice of the law.

In order that the medical profession should have charge of such administration, it should be through an organized body, the State Medical Society for example.

Dr. Thompson was inclined to agree with Dr. Baker, saying that State Boards of Health must not make themselves offensive to the people, consequently he was not in favor of the administration of such laws being in charge of the boards as it looked a great deal like sticking their noses into other people's business, and it also raised the antagonism of the profession.

Dr. McCormack said the variety of methods provided by the legislation of the different States for executing their respective medical practice acts gives evidence of great diversity of professional opinion upon this important practical subject.

The most potent objection urged against imposing the duty upon the State Board of Health is that it distracts the attention of the Board from its more distinctively sanitary work. If it really does this the objection is worthy of serious consideration. It has not seemed to have that effect in Illinois, Alabama and other States which might be mentioned. Again it has been urged that the influence of medical schools, newspapers and other supporters of the various forms of empiricism, in any State, operating upon the legislature, is likely at any time to threaten the very existence of the health board.

In other words, that the proper enforcement of a practice act is likely to rouse opposition not incident to its regular sanitary work. This phrase of the question has much importance in some States, particularly in the inception of the work, but this character of opposition has usually disappeared under a judicious and successful administration of the laws.

In Kentucky the hands of the Board have been strengthened by its work in this direction. Our efforts to suppress empiricism and to elevate the standard of medical education, have not only received popular and professional support but has seemed to increase the influence of the Board in every way. This may be due to some extent to the fact that the work has been entirely a gratuitous and obviously disinterested one.

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Dr. Salomon was of the opinion that the enforcement of medical laws should be placed in the hands of a board constituted for that purpose and that an applicant for a license to practice medicine should be examined even if he possesseed a bona-fide diploma.

Dr. Formento said:

State Boards of Health should not be charged with the administration of the law regulating the practice of medicine, *i. e.* they should not be examining and licensing boards, but should see that no one practices medicine without being properly qualified, such qualification to be proved either by diploma from some recognized school, or by special examination before the State Board of examiners.

The public health should be protected, and not undermined by unqualified practitioners and quacks.

I am in favor of such a board appointed by the Governor for a long term, on recommendation of the State Medical Society, such examination to be upon the principal branches of medical science, but without reference to any sectarian school, or dogma or doctrine, the candidate possessing as a preliminary condition, at least a fair primary school education.

The profession is getting to be over-crowded; the standard should be raised by requiring rigid examinations before an impartial and disinterested board. The teaching of medicine and the examination of candidates for practice should not be in the same hands, but distinct and separate as in England.

We are trying to have our legislature in Louisiana pass a law, "regulating the practice of medicine," from which great results are expected.

In this bill are embodied the main principles which I have advocated. The bill was carefully prepared by our State Medical Society. I am sorry to say that it failed to pass; it was killed on political grounds in one of the houses.

Dr. DeVaux said that in North Dakota, every person desiring to practice regardless of a diploma is required to pass an examination before a board of examiners.

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THE MICHIGAN PLAN FOR THE RESTRICTION AND PREVENTION OF THE DANGEROUS COMMUNICABLE DISEASES.

By HENRY B. BAKER, M. D., Secretary of the Michigan State Board of Health, Lansing, Michigan.

In Michigan, the State Board of Health has studied the vital statistics of the State, to learn what are the most important causes of deaths, with the view of expending the most of its energies in directions of most importance. The Board has learned that the diseases which cause most deaths, arranged in the order of their importance, are: Consumption, diphtheria, pneumonia, typhoid fever and scarlet fever.

According to the best information which I can obtain, these diseases are all communicable diseases, and all are preventable, with the knowledge now possessed by leading sanitarians. But when this Board began its work, the knowledge then possessed was not sufficient for the prevention of some of these diseases; and, because of the prevailing ignorance among the people, it was not practicable to deal with all the diseases concerning which the methods of prevention were known to the Board. A beginning was made on a few diseases concerning which the Board considered that it was practicable to educate the people generally. Small-pox was generally known to be a contagious disease, and the Board, at once, labored assiduously to educate the people into a knowledge of its prevention by vaccination and revaccination, and its restriction by isolation and disinfection. The result of that work by the Board has been investigated. Comparing the death-rate in Michigan from small-pox, before and since the State Board of Health was established, it was found that if the death-rate had remained as it was before the Board was established, more than one thousand five hundred and fifty-four (1,554) persons would have died of small-pox, more than have died of that disease. This was true at the close of the year 1887; and since that time the saving of life has been even more apparent.

Scarlet fever was one of the first diseases which the Michigan State Board of Health endeavored to restrict. The Board issued pamphlets, giving plain directions how to restrict scarlet fever.

These pamphlets were for general distribution; but the most important method, adopted by the Michigan State Board of Health, for the education of the people of the State, is the method for the distribution of the pamphlets, leaflets and diagrams relating to the restriction and prevention of the several dangerous communicable diseases.

The method is as follows: The law requires householders and physicians to report to either the president, clerk or health officer of the local

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board of health, every case of a disease dangerous to the public health. The law requires the health officer to report to the Secretary of the State Board of Health, and to keep him constantly informed relative to every outbreak of such disease. In addition to this official source of information, the local columns of newspapers, published throughout the State, are scanned at the office of the State Board of Health, for mention of diseases dangerous to the public health; this supplies information concerning those parts of the State in which the health laws are not well obeyed. As soon as information is received by the Secretary of the State Board of Health of the occurrence of a case of dangerous communicable disease in any township, city or village in Michigan, action is at once taken; record is made in a book relating to that particular disease, directions are sent to the health officer as to the restriction of the disease, and as to his reports to the State Board: and pamphlets, issued by the State Board, giving instructions for the restriction of the disease reported, are sent to him, with the request that the pamphlets be distributed to the neighbors of the family in which the disease is.

It is found that at such time as a dangerous communicable disease is actually in the neighborhood, people will read and pay attention to brief pamphlets issued by authority of the State. Self-interest tends to make such people believers in the statements then and thus presented to them.

This method is now, and for many years has been constantly acted upon, until now, the citizens of nearly every township, city and village in Michigan have had an opportunity for such instruction, at a time of more or less danger from each of the most common dangerous communicable diseases which the State Board has thus dealt with, namely, small-pox, diphtheria, scarlet fever and typhoid fever.

One result has been the lessening of the ravages of each of these diseases. This is proved by the statistics of deaths, collected by the Secretary of State; it is proved, also, by the statistics of sickness collected and complied by the State Board of Health.

(I will refer to this subject again, later.) Another result has been a gradually increasing confidence in the State Board of Health, which promises much for its usefulness in connection with other dangerous diseases, one of which (consumption) is of more consequence than any which has been dealt with.

Probably the most important result, however, is the enlightened public sentiment of the people of Michigan with reference to those dangerous diseases concerning which the State Board of Health has thus been so constantly educating the people. That public sentiment now, in very many localities in Michigan, will sustain and uphold a health officer in effective sanitary measures which without that public sentiment could not be entered upon with any prospect of success.

There can be no doubt on this subject, we have the positive evidence of it in many places where the plans of the State Board of Health have

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been adopted; and we have positive evidence of the absence of such a public sentiment in localities where the plans of the State Board of Health have been rejected. Thus, the city of Detroit contains about one-tenth of the inhabitants of Michigan, and although the Board of Health in Detroit was created through the influence of the State Board of Health, its health officers have always antagonized the efforts of the State Board; and the very important plan of the State Board for the gradual building up of public sentiment relative to the restriction of the dangerous communicable diseases has been rejected by the Detroit health authorities. They distribute a pamphlet but it does not carry with it the authority of the State Board of Health, and it is given to the family in which the disease is; but it is not systematically distributed to the neighbors of that family.

The result is that those dangerous communicable diseases which are of most consequence are not much restricted in Detroit; and it is claimed by the health officer that it is not possible to restrict them, because public sentiment will not so sustain the measure which should be enforced by the local health office; and the people generally will not so co-operate as to make it possible to restrict scarlet fever, and especially not diphtheria, concerning which the people have not been educated to a knowledge of its being strictly a communicable disease. The health officer estimates that it would cost nearly a million of dollars annually to restrict those two diseases in accordance with the plan of the State Board of Health, as set forth in its published pamphlets and documents. If his estimate is correct, it indicates something of the value of the systematic work on the plan of the State Board of Health, and of the cost of the rejection of that plan; because if that work had been done in Detroit as it has been done in some other parts of the State, nearly that entire million of dollars annually could be saved and also most of the sickness and of the very many deaths could be prevented; because the citizens of Detroit are not very different from the citizens of other parts of Michigan, and do not contain so large a proportion of ignorant foreigners as do some other parts of the State in which success has been reached by the plan of the State Board of Health, which includes the publishing of the several pamphlets, issued by the Board, not only in the English language but also in the different foreign languages, and the distribution of the information relative to each disease at the time that disease is actually present in the neighborhood.

Not every other place besides Detroit has adopted the plans of the State Board of Health, yet enough have done so to bring down the death-rates from diphtheria and scarlet fever below those in Detroit. This is especially so relative to diphtheria. For the year 1890, the reported deaths from scarlet fever in Detroit were 2 per 10,000 inhabitants, while outside of Detroit, the deaths in the State were 1.6 per 10,000 inhabitants, excluding the inhabitants of those localities in which scarlet

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fever did not occur, or at least was not reported. For the same year, the reported deaths from diphtheria in Detroit were 17 per 10,000 inhabitants, while outside of Detroit they were only 9.3 per 10,000 inhabitants, counting only the inhabitants of localities in which diphtheria actually occurred and was reported.

If the inhabitants of the whole State were counted in, the difference between the death rate in Detroit and in the rest of the State would be very much greater than is here shown.

Of the great usefulness of the plans of the State Board of Health, for the restriction of the dangerous diseases, we have abundant proof, and some of the evidence is of the nature of mathematical demonstrations.

Thus a study of the vital statistics of Michigan proves that, comparing the death rate, throughout the State as a whole, from scarlet fever before the State Board of Health was established with the rate since its establishment, up to the close of the year 1887, over 5,600 persons had lived who under the old mortality rate would have died of scarlet fever. This is an average saving of 400 lives per year, from that one disease scarlet fever. A similar comparison of the death rates, throughout the entire State, from typhoid fever, before and since the State Board has been dealing with that disease, proves that during the first period (1869–78) the rate was 37.71 per 100,000 inhabitants, while during the latter period it was only 30.87 per 100,000, a saving of 6.84 lives per 100,000 inhabitants, per year, or 1,359 lives during the eleven years since the work was begun. It is very apparent that the saving of life, and the still greater prevention of sickness, is not only greatest in the latest years when the numbers of inhabitants are greatest, but such education of the people as has been started by the State Board of Health when it has once been fairly inaugurated, tends constantly to spread, so that the influences already exerted by the State Board will continue, through all coming time, to have their beneficial effect.

The doctor's paper was discussed by Drs. Avery and Munn.

The following was received from Dr. Homan, of the State Board of Health of Missouri and presented to the conference by Dr. Baker.

PREAMBLES AND RESOLUTION PROPOSED BY DR. GEO. HOMAN OF THE STATE BOARD OF HEALTH OF MISSOURI.

WHEREAS, The importance of the speedy destruction of the dangerous or infective matters given off from the bodies of persons sick with communicable diseases cannot be too frequently or strongly impressed on the public mind; and,

Whereas, Practical experience and scientific experiment have alike proven conclusively the high degree of efficiency possessed by superheated steam, or steam under pressure properly applied, to speedily accomplish such destruction; therefore, be it

Resolved, That it is the sense of this conference in the interest of pub-

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lic health, that the duty and necessity of providing proper means for steam disinfection should be brought by the several State and Provincial Boards to the attention and impressed on the minds of all municipal and local boards of health as affording in the long run, the cheapest, readiest and most efficient practical method of securing the destruction of the germs and spores of diseases dangerous to animals and man, occuring or harbored in woolen garments, blankets, domestic furnishings, etc., the pecuniary value of which forbids their destruction by fire.

In support of the foregoing resolution, Dr. Homan offered the following remarks:

"Without presuming to speak with full knowledge as to the extent to which steam is used in this country and Canada for the purpose named in the resolution, still it is my belief that, with perhaps few exceptions, such use is restricted to quarantine disinfecting stations at our principal seaports, at which places the powers of the agent named to accomplish disinfection in the scientific meaning of the term is susceptible of almost daily demonstration. And it has, perhaps, been on account of the consideration item of expense involved in the complete equipment of such stations that the general impression prevails, in the interior of our country at least, that such a service to be effective must needs be costly.

It is for the purpose of not only advocating its employment and efficiency, but to endeavor to dispel this impression, that I have brought the matter to the notice of the conference with the hope that in so doing a closer study will be made of the ways and means by which the general employment of steam disinfection may be brought about, and its use extended even to small communities.

Aside from its well known power as a germ and spore destroyer, a consideration that should weigh in favor of live steam with practical sanitarians is the fact that no loss or damage in fibre, texture or color attends its proper use, and this is a matter of no small moment in dealing with the woolen clothing, blankets, bedding, etc. of poor people; these articles all being liable to injury or destruction by the use of chemical disinfectants, or heat otherwise applied. And apart from the failure of chemicals ofttimes to accomplish true disinfection, which tends to weaken popular confidence in the process, there is a popular prejudice against them arising from the damage done to personal apparel and household goods through their employment as complete or partial disinfectants.

In cities where constant necessity for real disinfection exists, separate establishments could be provided with all the requisite facilities complete, or if the finances failed in this respect, steam-tight chambers should be provided at public cost, and the use of the necessary steam hired from some nearby establishment. In small places wherever a steam grist or saw mill, or other establishment so operated existed, the means

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for true disinfection would be at hand; or, indeed, the portable generator used in connection with steam threshing machines could equally well be used, and at small expense.

As tending to show the present status of medical opinion in Missouri on the subject-matter of the resolution, I may be permitted to say that the Medical Association of the State, at its meeting last month, unanimously passed a resolution favoring the use of steam as a disinfecting agent, and commending it to the favorable notice of health authorities throughout the State; that the two most influential societies in St. Louis have taken similar action, while the board of health of that city is now considering the matter and will probably ask for the money to bring it into speedy practical use. It is also likely that the State Board will declare in favor of it at the next meeting, and recommend its employment where possible and expedient.

In conclusion, I beg to hope that the considerations thus set forth may meet your views, and lead to favorable action on the subject presented."

The resolution was referred to the following special committee with instructions to report to the conference at its next annual meeting.

Dr. Geo. Holman, Dr. P. H. Bryce, Dr. Henry Baker.

FINANCIAL STATEMENT OF THE TREASURER OF THE NATIONAL CONFERENCE OF STATE BOARDS OF HEALTH.

1891.	HENRY B. BAKER, *Treasurer.*	*Dr.*	*Cr.*
April.	To dues from Ohio,	$10 00	
April.	Paid bills of C. O. Probst, secretary of the conference:		
	Postage,	5 00	
	Clerical assistance,		$5 00
May.	To dues from Indiana, Ontario, Connecticut, Vermont, each $10,	40 00	
June.	Paid bill of Meyers' Bros., publishers. Balance on 1,000 copies of the proceedings of Nashville meeting, 400 circulars for Washington meeting, three books of receipts,	100 73	
June.	To dues from Wisconsin, Kentucky, Missouri, Maryland, Alabama, Delaware, Louisiana, Quebec, Massachusetts, North Carolina, Illinois, South Carolina, each $10,	120 00	
June.	Paid bill of Meyers' Bros., publishers. Circulars, envelopes, and printing,		11 00
July.	To dues from Iowa, Rhode Island, West Virginia, Pennsylvania, Michigan, New Hampshire, each $10,	60 00	
Sept.	To dues from New York,	$10 00	
Dec.	To dues from Florida,	10 00	
Dec.	Cash on hand (Central Michigan Savings Bank, Lansing, to credit of Treasurer National Conference of State Boards of Health),		$128 27
		$250 00	$250 00

HENRY B. BAKER,
Treasurer.

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FOURTH SESSION.

Miscellaneous Business.

The treasurer, Dr. Baker, made his report which was received and ordered printed in the transactions of the conference.

On motion an assessment of ten dollars ($10.00) was made on each State Board of Health which is a member of the conference.

In the absence of Drs. Bryce and Lindsley (Tenn.), who were to lead in the discussion of "The practical working of inter-state notification," it was decided on the motion of Dr. Baker that hereafter when small-pox and other dangerous diseases requiring inter-state notification, that such notices be sent to the other States at least weekly and oftener if necessary.

The next topic considered, "Is the disinfection of baggage essential to effective quarantine? The conference answered this question by a unanimous vote in the affirmative.

The following committee to formulate a plan for the creation and organization of county and other local boards of health, was continued:

Dr. Henry B. Baker, Michigan.

Dr. C. A. Lindsley, Connecticut.

Dr. Benjamin Lee, Pennsylvania.

The committee appointed to make a codification of health laws of the diffierent States and Provinces, was discharged.

The following Committee on the "collective investigation of diseases," was continued:

Dr. C. H. Fisher, Rhode Island.

Dr. S. W. Abbott, Massachusetts.

Dr Benjamin Lee, Pennsylvania.

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REPORT OF THE COMMITTEE ON VITAL STATISTICS.

Sickness Statistics.

By HENRY B. BAKER, M. D., *Secretary of the Michigan State Board of Health, Lansing.*

For many years, leading statisticians lamented the absence of, hoped for, commended and labored for the creation of—statistics of sickness.

Statistics relative to mortality are useful, and have supplied important bases for sanitary work and progress; but mortality statistics come too late for the greatest immediate usefulness by practical sanitarians engaged in restricting dangerous diseases. They are also too distant from the conditions which cause the disease to be most useful in studying the causation of diseases. The exceeding great expense attending the reporting of *all* sickness has always, thus far, prevented the attempt, except in the case of armies, navies, etc., where such requirements can be enforced.

To Benjamin Ward Richardson, M. D., LL.D., one of the leading medical and sanitary minds in Great Britain, should be given the credit for the invention of a method of obtaining valuable sickness statistics without the immense expense involved in collecting records of *all* sickness. His plan was to have a considerable number of representative medical practitioners in active general practice report regularly to a central office, the reports to be there compiled. He inaugurated this system, and maintained it long enough to prove its usefulness, when the expense, even of this system, was too great to be carried on by private enterprise; he tried to have the general government of Great Britain take it off his hands, but failing in that, the undertaking was abandoned.

To the Massachusetts State Board of Health belongs the honor of being the first governmental officers, aside from those of armies and navies, to establish a system of sickness statistics. That Board adopted substantially the system inaugurated by Dr. Benjamin Ward Richardson, and maintained it very successfully for one year; the published results yielding information of exceedingly great interest and value. But the Massachusetts State Board of Health changed Secretaries, and, apparently, the new officer did not appreciate the important work of his predecessor; at any rate the valuable sickness statistics then ceased.

To Michigan, after all, must be given the greatest credit for having adopted, perfected, and successfully maintained through a series of years, the most satisfactory system of sickness statistics the world has yet seen. It commenced in 1876, and adopted, at first, very much the same system as had been proved to yield such valuable data in Massa-

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chusetts. But, from time to time, improvements have been made. The most important change was made in May, 1885, since which time the representative physicians in active general practice who report regularly each week, are asked to report only the sickness which occurs under their own observation. The system is thus on a more accurate scientific basis than when the reports included sickness which occurred in the vicinity, under the observation of other physicians; because the opportunities for conferring with other physicians vary greatly, and thus cause variations in the reports which are eliminated by confining the reports to answers to direct questions, relative to each important disease, did you or did you not, during the given week, see a case of that disease? How many cases did you see?

This system of sickness statistics rests upon the "law of averages," in accordance with the "law of probabilities," which makes it probable that a considerable number of representative physicians in active general practice, in localities distributed fairly well about a State, will see an average of the sickness which occurs. Theoretically, this was true before the system was inaugurated. Practically, it has been demonstrated to be true, by the several combinations of the sickness statistics which have been made in Michigan. For instance, it was questioned whether the small number of reports received in time for the weekly bulletin, being about fifty, were sufficient to supply a fair statement of the sickness in Michigan, throughout the State. The question seems to have been answered in the affirmative as follows: When the fifty reports are compiled, and afterwards fifty more reports are received and compiled, it is generally found that the results of the two compilations are practically the same; indicating that both results are correct. Again, speaking now of the whole number of reports received and compiled in the Annual Report, although during the years 1877–84 the system was not as perfect as since May, 1885, yet such diagrams as that on page 255 of the Annual Report of the Michigan State Board of Health for the year 1886 (reproduced further in this article), prove that the results of the compilation of the weekly reports of sickness then yielded statistics of very great value, and statistics which bore on their face the evidences of reliability, being consistent from month to month, and from year to year. Not only that, but when placed beside the results of tri-daily observations of such "instruments of precision" as the standard thermometers in use by the regular meteorological observers in Michigan, these sickness statistics relating to the prominent diseases bore an astonishingly close resemblance to the statistics of the observations of the thermometer. The similarity of the two curves, representing the two sets of observations—of the sickness and of the instruments, is such as to lead to the conviction that both sets of observations are true, and that there is a necessary relation between the sickness and the atmospheric temperature. Until the sickness statistics in Michigan sup-

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plied the scientific basis for such studies, such knowledge as that to which I have just referred was not in existence, as a scientific induction; it rested upon the insecure foundation of dogmatic assertions, not supported, as it now is, by large numbers of facts classified and tabulated. Again, diagrams have been constructed containing curves representing the *sickness* reported from several important diseases, and these curves have been compared with curves representing the *mortality* from those diseases during the same time in Michigan. These comparisons have demonstrated that both kinds of statistics are valuable; although it showed, as was known before, that the mortality statistics in Michigan are not as complete during the earlier as they are during the later months in each year, for reasons which have been published, and have long been well known to those who understand the vital statistics of Michigan.* It is to be hoped that the legislature will be induced to give this subject attention, and will so amend the law for the collection of the mortality statistics as to require that each death shall be immediately recorded, as the sickness now is, within a week of its occurrence, and not be as the deaths now are, neglected for a year or so before being placed on record.

It is apparent, to whoever will take the trouble to investigate the subject, that the sickness statistics of Michigan are extremely valuable. The vast mine of valuable information has been only very slightly worked as yet, for the reason that few private individuals can find the time to do such careful painstaking work for such long-continued researches as are required to so marshal the vast members of facts as to bear upon a question in the causation of disease. Such work for the benefit of all should be done once for all by some one representing the whole people.

Enough has been done by the Secretary of the State Board of Health to prove that the sickness statistics of Michigan are a mine of wealth which will richly repay the work of developing. The part which has been developed is that relating to the diseases of the throat, lungs and air-passages, and those dangerous communicable diseases which enter the body by way of the throat and air-passages. It has been demonstrated that the causes which increase these diseases are associated with coldness of the atmosphere, and that the relation is not only qualitative. This information alone is of sufficient value to repay all and more than has been expended for the statistics. But the "cold-weather diseases" are only one part of all—there remain to be studied the great classes of diseases which prevail most under opposite conditions. There remain also the studies into the exact conditions which are causative of each disease, and those which are only accidental. And, after all the factors shall have been worked out, there will remain the study of the rate of decline of each disease under the influence of the appropriate meas-

* Explained on pages 3–12, and 158–167. Vital Statistics of Michigan, 1871.

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ures which shall be inaugurated for the prevention or restriction of each disease. Consequently, it should be a long time before the collection, compilation, and utilization of sickness statistics should cease. Should such work ever cease? It would seem not; because even if the causation of all the prominent diseases shall become known, the preventive and restrictive measures thoroughly applied, and the diminution of all preventable diseases shall reach its maximum, there should still be constant surveillance of such sickness as shall remain, in order to be prepared to enter at once upon measures which may at any time be indicated as necessary.

There is another reason than the one already stated why we may not expect the sickness statistics to be immediately used by people generally, but only by statisticians or persons who are willing to work hard and thus grasp the principles of statistical methods. That reason is found in the fact that the sickness statistics do not impress the average person, especially not the casual observer, as being sufficiently reliable upon which to base questions involving human life on a grand scale as is demanded by public sanitation. To some of the physicians who contribute the weekly reports, it seems almost or quite incredible that from the experience of one person like himself in a place, and comparatively few places in Michigan, can be built up statistics which shall enable one to know the exact relations of all the most important and common diseases to the varying conditions of the atmosphere.

Perhaps as useful a service as can be done, at the present time, is to point out how it is that the fifteen years experience with the sickness statistics of Michigan has resulted in the development of statistics which are not only the best that the world has ever seen, but that can be demonstrated to be perfectly reliable.* Some such demonstration here follows:

It is extremely difficult for any person to master the subject of vital statistics. This should not be wondered at, because all questions relating to the life of man—the most complex of all organized beings—are complex; and the laws or principles of even ordinary statistics are not generally understood. To hear statistics spoken of as unreliable, is a very common occurrence; but it is true, and ought to be generally known, that no general fact is established or can be established except by the statistical method. One experience or one observation of a fact does not establish anything; a few experiences or observations may lead to a belief; but it is only by the grouping together of oft-repeated ex-

*The confident tone in some portions of this report may be accounted for by the fact that the member of this committee was, for a few years, engaged in compiling and studying general statistics, and for twenty-one years has been continuously engaged in compiling and studying several kinds of vital statistics. Accordingly, it is assumed that this long experience and study of statistical science and practice, especially of vital statistics, enables him to test and judge of the reliability of such statistics.

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periences or observations of facts that a general fact is established; and *the grouping together of experiences and observations of facts*, is the essential part of statistics. Therefore there is no higher method, no more reliable method, than the statistical method. That method is the one employed in every science. For instance, the chemist makes an experiment, and observes a result. In order to reach a conclusion, however, he must repeatedly observe the same result to follow repetitions of the same experiment. If, because of the imperfections of all manipulations, he does not always reach precisely the same results, he continues, by the statistical method, to learn the amount of the probable error, and, if that is within the limits of variation warranted by the nature of the manipulation, he uses the average result, and if the observations are sufficiently numerous, he relies upon that result; that is to say, if he has (what is really, although he may not so consider it) a *statistical* basis for his conclusion he is satisfied. Not only the science of chemistry, but all sciences rest upon similar foundations.

One of the most common fallacies in the minds of intelligent people, is, that statistics are not reliable unless *all* the facts on the given subject are collected. Concerning vital statistics, this false idea is extremely common, even among scientific men who in their own science never seem to think of the comparative paucity of the facts upon which their own conclusions are based. A chemist, for instance, will base conclusions on less than a hundred experiments, sometimes less than a dozen, yet, in vital statistics, he would be likely to question results of observations of many times that number of experiences; and very likely demand that records be used of all the possible experiences.

Few people realize how perfect is the knowledge which may be gained by statistics which embrace only a small fraction of the great mass of facts which might be collected on the same subject. Take, for instance, in the science of meteorology, the statistics of temperature; it is well known that thermometers hung on the different sides of any building will rarely exactly agree. But it is not so well known that if *one* intelligent and reliable observer take tri-daily observations of a thermometer placed under proper conditions, in a central location, as, for instance, in Lansing, the results of his observations supply a reliable basis for conclusions concerning the entire State of Michigan, as to the comparative temperature in each month of every year. This is susceptible of demonstration, so that any intelligent person can appreciate the result; and a demonstration for a single year is given on page 27 of the Annual Report of the Michigan State Board of Health for the year 1886, and a similar demonstration is in nearly every annual report. Page 27 of the report for 1886 is here reproduced, diagram 1, on page 461. By that diagram it may be seen that a curve, accurately drawn to scale, representing the exact average daily temperature at Lansing (the line —ox) is very nearly the same as the curve representing the average for twenty-

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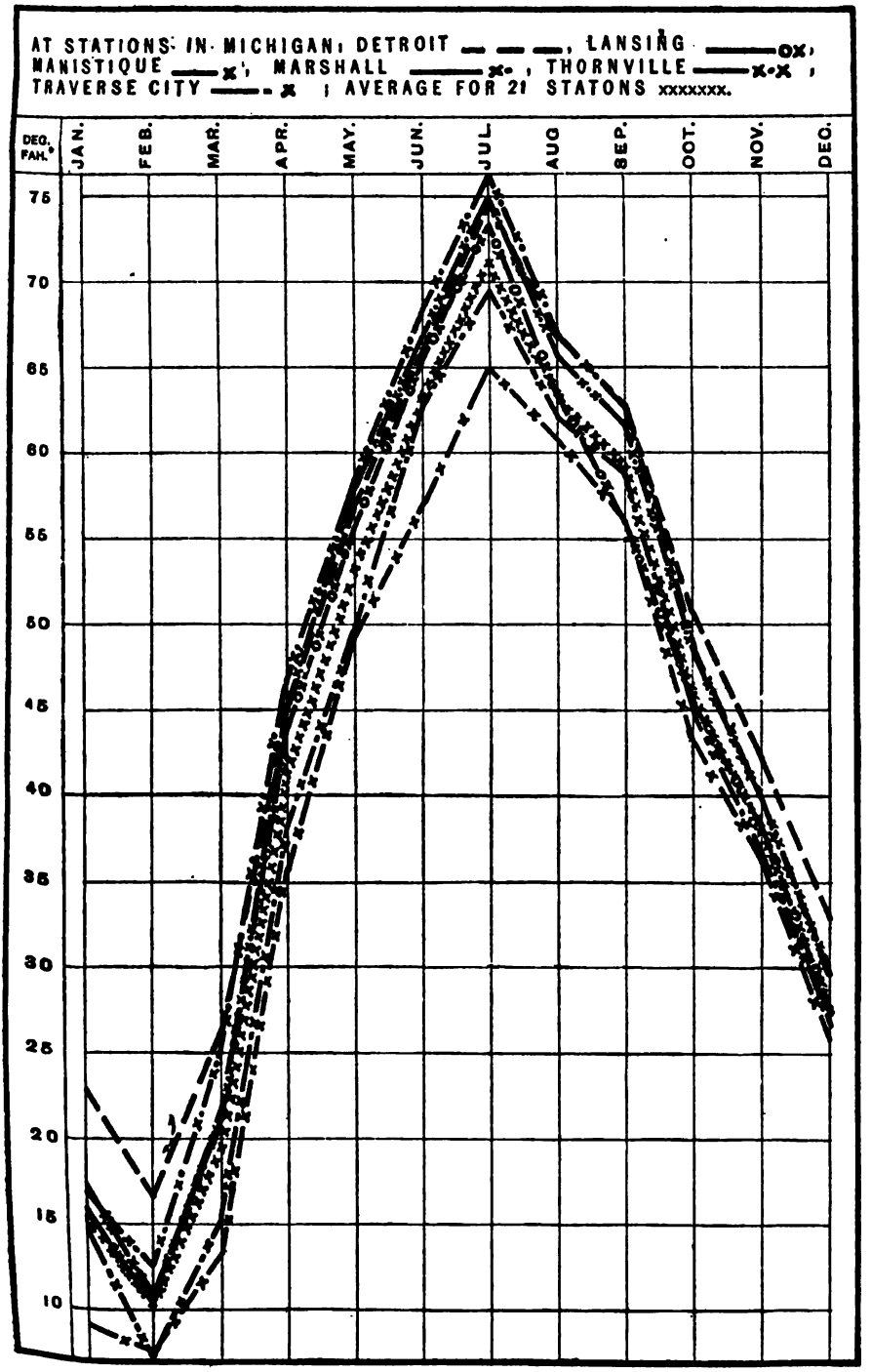
DIAGRAM I.—AVERAGE TEMPERATURE, BY MOS., IN 1885.



*SCALE, 10° F. TO .92 IN. VERTICALLY.

H. B. T., DEL. DES. BY H. B. B.

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one stations in Michigan (in the line xxxxxx). For most purposes the results of the observations of one thermometer by a single person in a central location are sufficiently accurate and reliable upon which to base conclusions for the entire State of Michigan. Yet this person is only one of two millions of inhabitants of Michigan, probably half of whom might make observation of the atmospheric temperature, each under conditions slightly different from those of any other person. Why is it that the results of observations by these six persons whose work is represented in diagram 1, prove to be so accurate that each curve is sub stantially the same as the others? It is because they all use reliable "instruments of precision," because they are careful observers, and because for each significant point in diagram 1, *there were a sufficient number of observations to secure the true average.* This last reason is one which should be understood, because it is an important subject in all statistics. It is a fact that, in grouping together results of large numbers of observations, minor variations tend to neutralize each other, so that the average of a large number of observations exhibits the general truth which pervades them all.

Frequently it is perfectly easy for a statistician to learn whether or not he has a sufficient number of observations to yield the general truth for which he seeks. All that is necessary is to compile a number of the observations, and from the results make a curve such as is shown in diagram 1. Then compile another group of observations on the same subject, and from those results make another curve; then compare the two curves; if they agree, it proves that either one of the curves is as good as both; that the general truth has probably been reached by the number of observations used in either of the experiments. This test has been applied to the sickness statistics of Michigan, by taking about one-half of the weekly reports of sickness, and then the other half; and it has been found that fifty weekly reports of sickness supply a sufficient number to give a fairly accurate statement of the sickness in Michigan. Generally that number of reports are received in time for the weekly bulletin; the average for the three years 1889-91 was 58. But for the tables, diagrams and studies of the sickness statistics in the annual report of the State Board of Health, a much larger number is secured, the average for 1889-90 being 98 per week. A few facts on this subject are shown in tabular form as follows:

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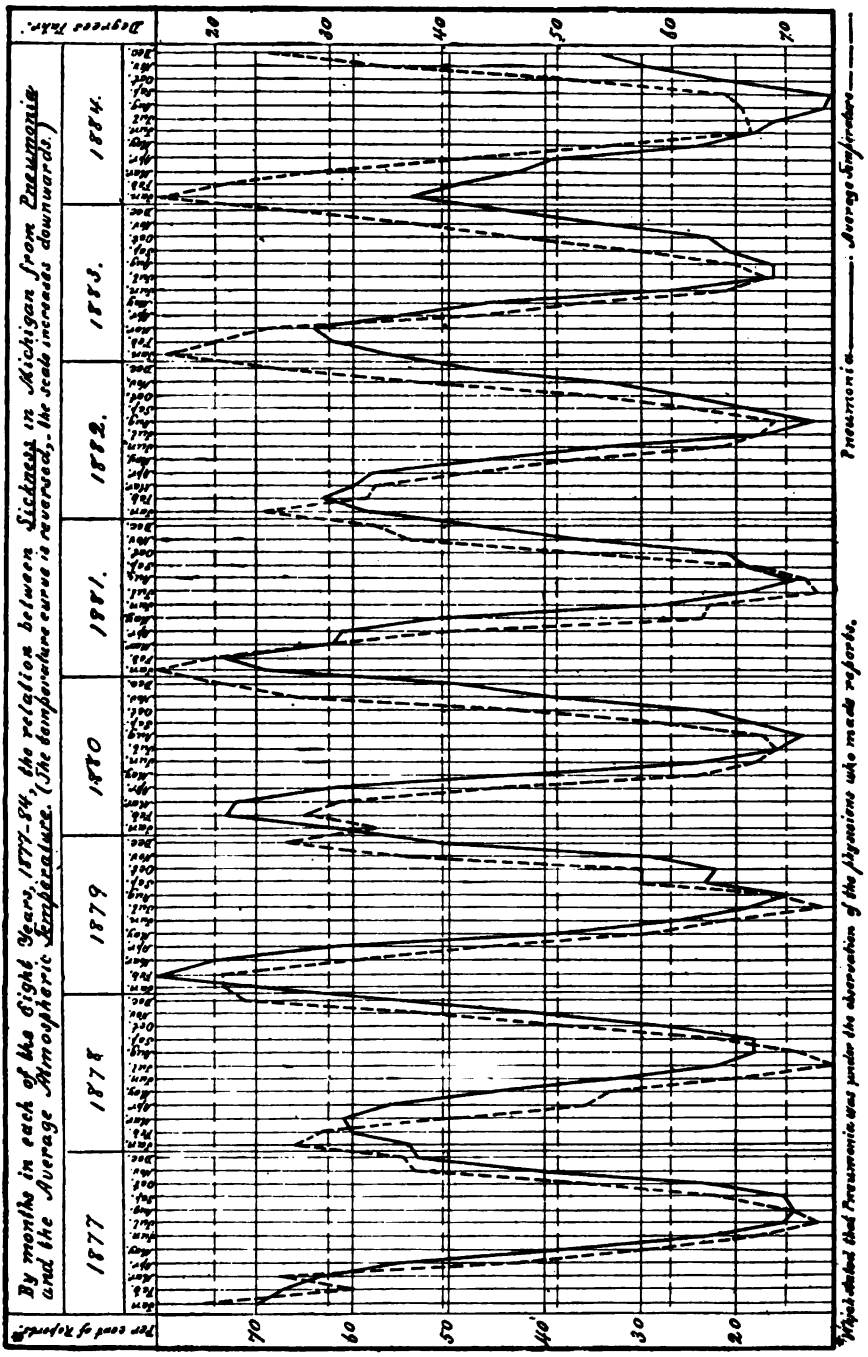
By months in each of the Eight Years, 1877-84, the relation between Sickness in Michigan from Pneumonia and the Average Atmospheric Temperature. (The temperature curve is reversed, - the scale increases downwards.)
Degrees Fahr.
20
30
40
50
60
70
1877
1878
1879
1880
1881.
1882.
1883.
1884.
Per cent of Reports.
70
60
50
40
30
20
Pneumonia
Average Temperature
Which stated that Pneumonia was under the observation of the physicians who made reports.

Weekly Reports Received.

For the Weekly Bulletins.				For the Annual Reports.
Year.	Least.	Most.	Average.	Average per week.
1889, ...	42	73	53¾	96
1890, ...	44	76	62½	100
1891, ...	44	74	59	87
Averages, .	43	74	58*	94*

In the annual report, no attempt is made to study the subject by weeks, the lowest unit is by months, so that for each significant statement in a table or diagram, about four hundred observations are grouped to learn the average statement.

But even the evidence of four hundred reports is not relied upon to finally decide the exact relation which a given disease sustains to atmospheric temperature, or other causative condition of sickness, although frequently it might safely be relied upon, as is proved by the diagram on page 255 of the annual report of the Michigan State Board of Health for the year 1886, which diagram is here produced. Diagram No. 2, page 461. The custom of the writer has been to still further multiply the evidence by grouping it by months for a *series of years*. Thus in diagram No. 1, page 252. Report of Michigan State Board of Health for the year 1886 (reproduced here, page 465) over 30,000 weekly reports of sickness and over 150,000 observations of the atmospheric temperature are represented. The result is that there is such a scientific demonstration of the relation of those two phenomena as to carry conviction to the mind of any sane, intelligent person who will take the trouble to study the subject. No such person can have a "reasonable doubt" of the truth of both sets of observations there delineated. The tables and that diagram demonstrate completely and settle the question for all time, as to the relation of the sickness from pneumonia to atmospheric temperature in Michigan during those years; the sickness decreases as the temperature rises and increases as the temperature falls, and the relation is almost exactly quantitative. To demonstrate the fact that the relation is very nearly quantitative, it is only necessary to make a few simple computations, and to graphically picture to the eye the results of those computations as follows:

A table exhibiting the average temperature and the average per cent. of the weekly reports which stated the presence of pneumonia, as graphically represented in the diagram (No. 1) is as follows:

* The average number of weekly reports received per week for the annual report was 62 per cent. more than those received in time for the weekly bulletin. Then the *probable* least number received per week for the annual report would be 62 per cent. more than 43 (the average least number received in time for the weekly bulletin) or 70.

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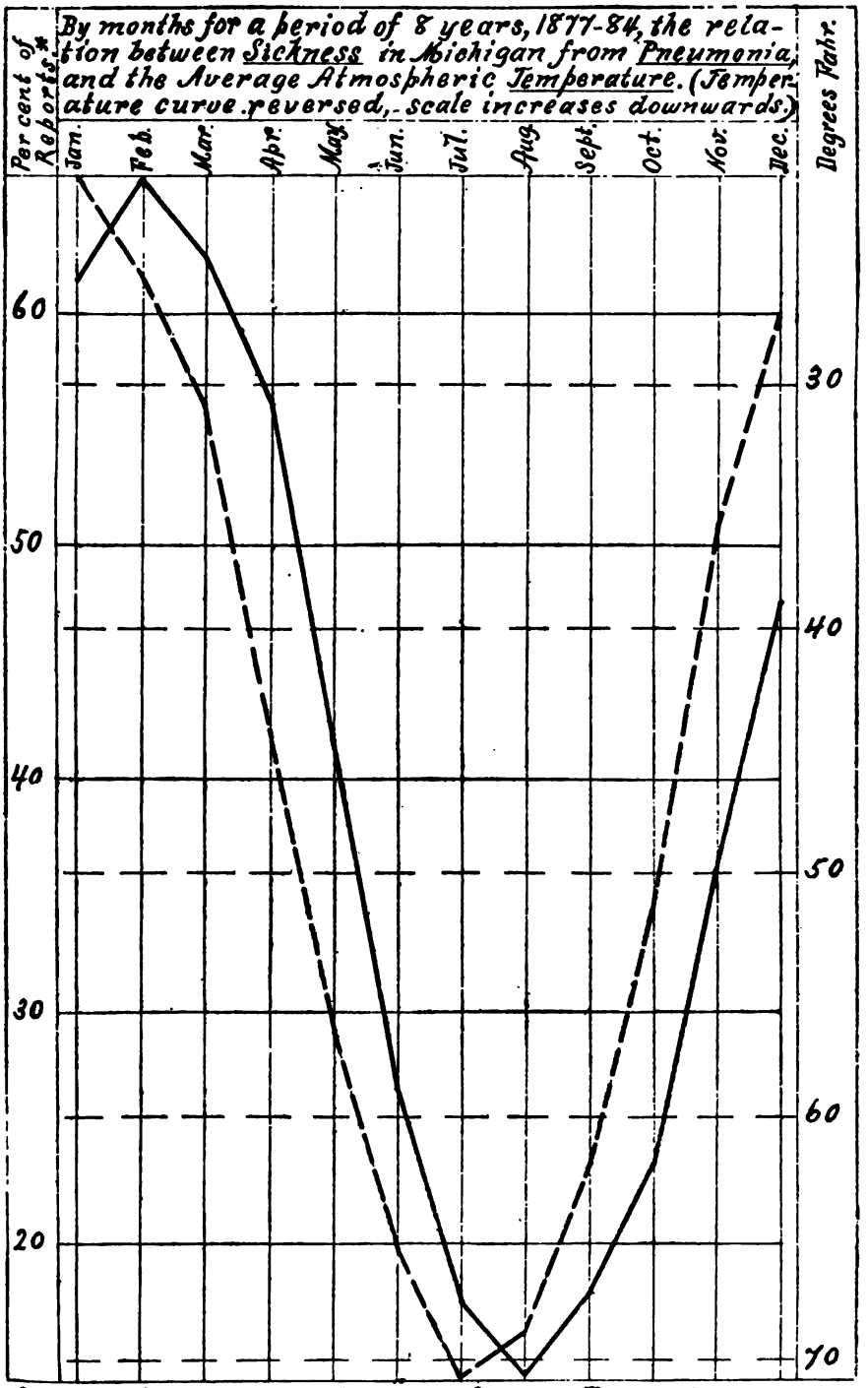

Sickness from Pneumonia ——— Average Temperature — — —.

*Per cent of all reports received which stated the presence of pneumonia then under the observation of the physicians reporting.

Over 30,000 weekly reports of sickness, and over 150,000 observations of the atmospheric temperature are represented in this diagram.

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TABLE NO. 1.—*By months for a period of eight years, 1877–84, the relation between sickness from pneumonia and the average temperature of the atmosphere in Michigan. (A fraction of 5 or more is called 1, of less than .5 is disregarded.)*

EIGHT YEARS 1877–84.	Jan.	Feb.	Mar.	April.	May.	June.
Average temperature, deg. F., . .	21.43	25.60	31.04	44.48	56.60	65.54
Average percentage of reports of sickness, ...	62	66	62	56	42	27

EIGHT YEARS 1877–84.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average temperature, deg. F., . .	70.68	68.85	62.05	51.34	35.99	27.25
Average percentage of reports of sickness, ...	17	14	18	23	36	48

It may be seen that the difference between the lowest temperature (21.43) in January and the highest temperature (70.68) in July, is 49.25° F. It may be seen that the difference between the least sickness (14 per cent. of reports) in August, and the most sickness (66 per cent. of reports) in February was 52. If we assume that a change in atmospheric temperature equal to 49.25° F. causes a change in the sickness equal to 52 (per cent. of reports), what change in the sickness should follow a change in temperature of 4.17° F., as occurred between January and February? (The average during the eight years embraced in the diagram). As 49.25 is to 52, so is 4.17 to the answer sought. The answer is 4.42. Then, inasmuch as it is plain, by the diagram, that the sickness changes follow a month later than the temperature changes, and inversely to the temperature, and the temperature change was a rise, there should have been a fall in the sickness equal to 4.4, from what it was in February. In February the per cent. of reports was 66; 66—4.4=61.6 which is the computed sickness for March. Similarly, as 49.25 is to 52, so is 5.44 (the temperature rise between February and March) to the fall in the sickness in April. Continuing this process through the several months, we compute a table exhibiting the sickness as it would be if exactly quantitative relations hold throughout.

(Practically, the computations are more quickly made by obtaining a unit of measurement, which may be done by dividing the total range of per cent. of sickness (52) by the total range of temperature (49.25); when the quotient (1.06) will be the unit of variation in per cent. of sickness equal to a variation of one degree of temperature.) The computed table is as follows:

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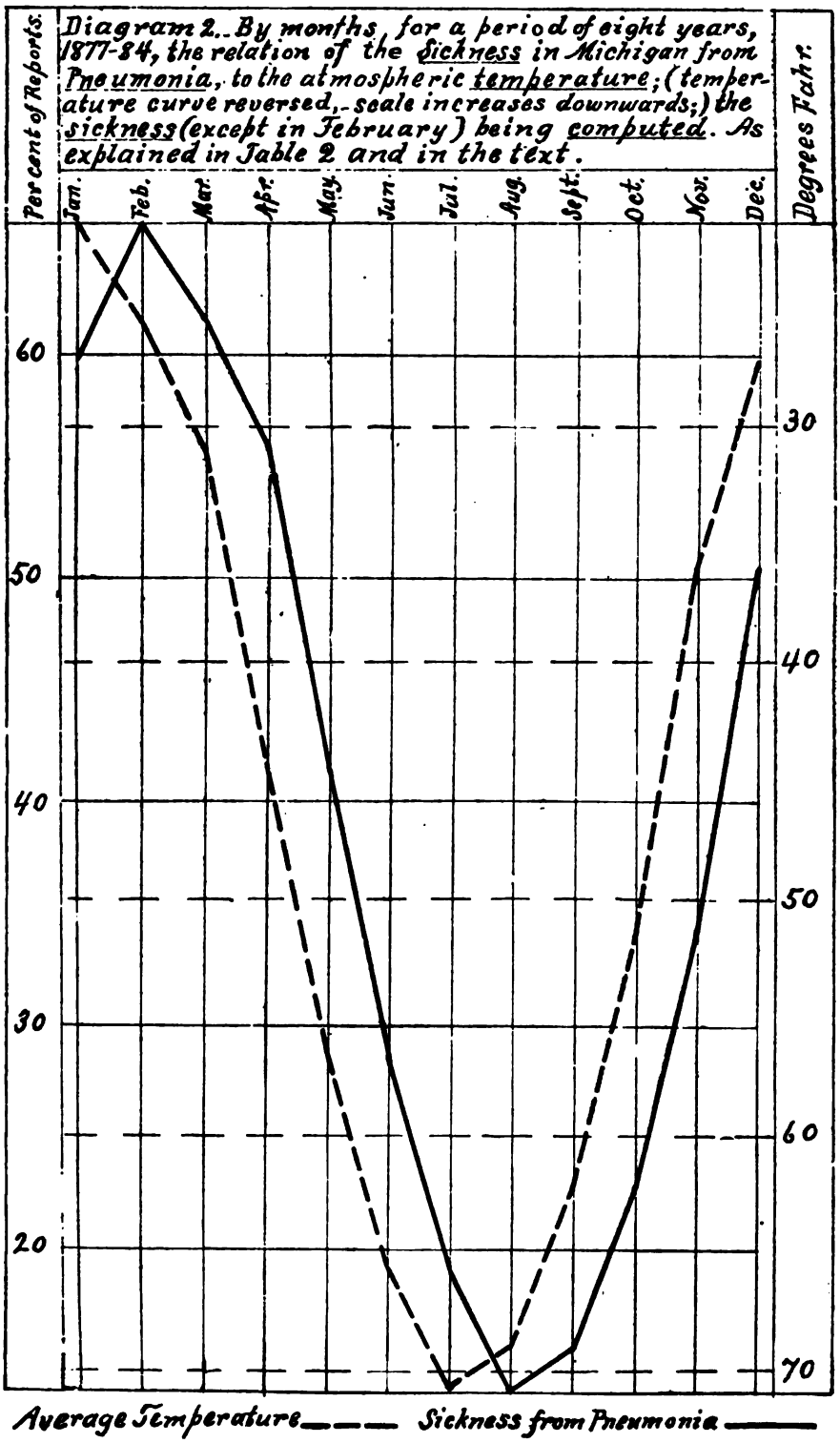

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TABLE NO. 2.—*By months for a period of eight years, 1877–84, the relation between sickness in Michigan from pneumonia, to the atmospheric temperature; the sickness (except in February) being computed, assuming that, in each month, the rise or fall of the sickness sustains the same relation to the rise or fall of the atmospheric temperature in the preceding month, as the total range of sickness sustains to the total range of monthly averages of temperature for the year. (A fraction of .5 or more is called 1, of less than .5 is disregarded.)*

EIGHT YEARS 1877–84.	Jan.	Feb.	Mar.	April.	May.	June.
Average temperature, deg. F., . .	21.43	25.60	31.04	44.48	56.60	65.54
Average percentage of reports of sickness, ...	60	66	62	56	42	29

EIGHT YEARS 1877–84.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average temperature, deg. F., . .	70.68	68.85	62.05	51.34	35.99	27.25
Average percentage of reports of sickness, ...	19	14	16	23	34	51

This table may be compared with table No. 1, which exhibits the actual statistics as compiled from the reports. This computed table is graphically represented in diagram No. 2 (page 467) which can be compared with diagram No. 1, which represents the actual statistics as compiled from the reports. By comparing the two tables it will be seen that in six of the months the figures are the same in each; in the other months they are nearly the same, the greatest difference being in December, for which month the actual figures fall short of the computed ones by 3. The comparisons are best made by means of the two diagrams 1 and 2. But before or after comparing the two diagrams, it seems marvelous that accurate curves representing two such different phenomena as atmospheric temperature and sickness from pneumonia, observed and reported by entirely different classes of persons, should be found to run so almost exactly parallel as do the two lines in diagram No. 1. That twelve successive changes in atmospheric temperature should be followed by twelve successive changes in the amount of sickness, so almost exactly in proportion to the temperature changes can be accounted for only by the belief that there is a necessary relation between those two phenomena. If there is a necessary relation, it should be quantitative, unless other phenomena cause variation. The variation thus far apparent is so small as to indicate that it may be due to very slight imperfections in the observations. To which set of observations the slight variation is chargeable—whether of the temperature, by the meteorologists, or of the sickness, by the physicians—remains to be ascertained; because, although the temperature is learned by the use of

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"instruments of precision," the observations are not made every hour of the day and night, but only three times a day, and this may not, in every month, give us the exact average temperature, while the sickness reports represent all the time, day and night. On the other hand, during the years represented in the diagram, the sickness reports were on the old plan, including all sickness believed to occur, even if not under the actual observation of the physician who reported. The subject can be further studied, and the exact truth can be ascertained. But these refinements in statistics are for expert statisticians. That they exist in the sickness statistics of Michigan is conclusive evidence that these statistics are exceedingly accurate. And it is gratifying to know that by means of the sickness statistics of Michigan the essential facts as to the casual relation of pneumonia to atmospheric temperature has already been learned. It remains for pathologists and sanitarians to utilize that knowledge, and finally to point out to the people how to take advantage of that knowledge and use it for the lessening of sickness and deaths from pneumonia.

What has been done relative to pneumonia has been done for several other very important diseases, including the most important one of all —consumption.

It is a fact that the work with sickness statistics in Michigan is now in advance of some of the other lines of scientific research, and before reaping the full benefit of the statistics we must wait for other sciences, but that is not a valid reason for stopping the important work of collecting facts with which to still further advance the work with sickness.

So important are the scientific results, concerning the causation of disease, already obtained by the present Michigan system of sickness statistics, and so promising are the results yet to be worked out, that I am constrained to most earnestly plead with the other State Boards of Health to take up and carry forward this system of sickness statistics.

If the several State Boards will do this, it will then be much easier than otherwise it would be for a national public-health service to constantly have such knowledge of the actual state and condition of health in every part of the United States as it should have to enable it to best guard from time to time, the highest interest of the people of this great country.

Such a system of sickness statistics for the United States will be essential before it can be known what on the whole, are the conditions which tend to the most perfect health, and what are the conditions most important to be avoided or guarded against. The Michigan statistics indicate that atmospheric conditions are the *controlling* causes of most of the important diseases, those which cause most deaths. It is a fact that the migratory birds have, and act upon such knowledge. Man's control over nature is increasing, and will increase much more rapidly if preventable sickness and premature death are stopped. This country is

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being traversed by an intricate net-work of railroads. Through increasing prosperity because of lessened burdens on account of the prevention of sickness and deaths, the people are becoming able to travel, whereas formerly it would have been impossible. It should soon be practicable for man to approach in wisdom and in practices the migratory birds. A long step in that direction will have been taken when a good system of sickness statistics has been established throughout this country.

The Committee on the Prevention of Consumption made the following report, and was continued:

REPORT OF PROGRESS OF THE COMMITTEE ON THE PREVENTION OF TUBERCULOSIS.

GENTLEMEN: Your Committee has the honor to present its report of progress on the problem of how to prevent the spread of tuberculosis.

While there have been abundant indications of the progress of public sentiment, in the direction which was indicated in the report adopted as a partial report last year, yet it cannot be said that any positive advances have been announced, as had been the year before when the discovery of the assumed value of tuberculin had been made.

The failure of this discovery in producing those curative results, which some medical men are continually seeking, "in some new thing," has probably caused both physicians and the public to turn again toward those preventive measures of hygiene, sanitation and climate which this conference has set forth as marking the true line of progress in lessening the prevalence of this fatal disease.

The report brought in by the committee last year, and the conditions therein set forth, are such as your committee still believe to be practical and abreast of modern scientific opinion on the subject.

In the experimental field most of the work done has been on the uses of tuberculin in the diagnosis of tuberculosis in cattle.

The following summary of work done is fairly satisfactory; but as Nocard has said, the value of tuberculin "requires the baptism of time in order that a true estimate of it may be arrived at."

The results obtained by the use of tuberculin in diagnosis of tuberculosis in cattle have been somewhat uncertain; some observers, Nocard for instance, consider the results sufficiently unsatisfactory to exclude the use of it at present. Others are more sanguine and would advocate its use in all cases where a doubt exists.

In some cases where the typical reaction obtained after the injection of tuberculin and yet at the autopsy the results appeared negative, a closer examination of the tissues showed that the disease was in the incipient stage, in one case for instance meningeal.

Perhaps the latest researches published in this line are those which appeared in the last number of the Arbeiten of the Imperial Health

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officer at Berlin. These were carried on under the direct supervision of the Imperial Health Office at Berlin, Carlsruhe and Manheim, and the results are as follows:

At Berlin (64 animals) 82.4 per cent. of the animals which reacted proved to be tubercular, whilst 69.2 per cent. of those which did not react were not tubercular.

In Carlsruhe and Manheim (69 animals) the results were better, 86.2 per cent. of those which reacted were tubercular 97.5 per cent. of those which did not react were not tubercular.

The injection apparently was particularly efficacious in those cases in which doubt existed or in which indeed no external symptoms lead to suspicion of tuberculosis.

Your committee would respectfully suggest a continuance of a committee on this important subject.

The erection of hospitals for the treatment of the disease and isolation of patients has proved on the whole the direction in which medical progress and social philanthropy tends to move; and from the preventive standpoint your committee would most strongly recommend that the conference encourage such work by all means within its power.

All of which is respectfully submitted.

P. H. BRYCE,
VICTOR C. VAUGHN,
LUCIEN F. SALOMON,
Committee.

The report of the "Committee on the Pollution of Streams, and the Formation of Rivers Conservancy Commissions" will be found in another part of the proceedings.

The committee was continued.

The following officers were elected:

DR. J. N. MCCORMACK,
President.
DR. C. O. PROBST,
Secretary.
DR. HENRY B. BAKER,
Treasurer.

Conference adjourned.

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REPORT OF THE SECRETARY AS DELEGATE TO THE SECTION ON STATE MEDICINE OF THE AMERICAN MEDICAL ASSOCIATION, HELD AT DETROIT, MICHIGAN, JUNE 7, 8, 9, 1892.

First Day—June 7.

Minutes:

Inspection of Packing Houses, by Dr. R. Harvey Reed.

Needful Legislation for the Protection of Human Life, by Dr. A. N. Bell.

Paper on Public Baths, as a Prevention of Disease, by Dr. C. H. Shepard.

The Sanitary Side of the Drinking Question, by Dr. T. D. Crothers.

Present, Doctors Benjamin Lee, A. W. Bell, C. F. Ulrich, Francis A. Atkins, Charles Lindsley, J. H. Hamilton, J. W. Hamilton, J. Berrien Lindsley, Irving A. Watson, Laurence F. Flick, James F. Hibbard, Ralph E. Starkweather, Charles H. Shepard, Jerome Cochran, Charles McIntyre, Thomas A. Foster, Charles D. Alton, W. L. Schenck, W. S. Davis, R. H. Reed, Delos Fall, S. C. Johnson, Felix Formento, J. T. Reeve, William Bailey, A. Hazlewood, U. O. B. Wingate, Albert L. Gihon, Walter Wyman, T. D. Crothers, Alonzo W. Garlock.

Session called to order at 3:30 o'clock, Dr. Lee in the chair.

Dr. Lee read his address, subject, "The Responsibility of the State and National Government in Regard to the Protection of the Purity of the Water Supply."

Dr. Lee introduced his paper by some remarks upon the work of the section. On motion thanks were returned Dr. Lee.

Dr. R. Harvey Reed read his paper on the meat question.

Before reading his paper he made a brief statement of the methods practiced in the slaughtering pens. He witnessed the slaughter of unhealthy cattle. The number of inspectors is too small to do the work properly. He said he had carefully watched this.

His paper concluded with a series of resolutions.

It was moved and seconded that the report be received. Adopted.

Dr. Hibbard said he had been much interested in the inspection at Kansas City. The inspector at Kansas City said to Dr. Hibbard that he (the inspector) would not publicly make any statement, but would give it privately. He told Dr. Hibbard that two men made the antimortem examination or inspection, and that those two men were merely butchers with great experience. That the close inspection was only made in cases reported as suspicious by these two men. Cases that were clearly unhealthy, were condemned and sent to the phosphate department. He said the business itself protected the public somewhat because the firm could not afford to send out bad meat. Dr. Hibbard stated that he himself, after what he had heard and seen had pretty good confidence in the inspection.

Dr. Reed said that only cases in which tuberculosis was suspected were really closely examined. Under the present methods no protection

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is had against hog cholera. In manufacturing the various things made out of hog's intestines no care is observed. In cleaning the intestines for sausages, they are thrown in a barrel and allowed to remain there until they become so offensive as to be almost unbearable, and are carelessly cleaned out of these barrels. Intestines when cleaned for sausages still contained mucus and other foul matter. The Bologna sausages are dried instead of smoked. Only two hours are given to smoking. It is such prepared meat as this that causes poisoning. The hams are cured in four or five days. They inject the hams with pyroxilic acid and other matters. The packing house ham has a peculiar sourish smell. It is important that there should be a more perfect method of inspection. The hogs are drawn up by the legs, stuck, scraped, all of which is done in a few moments.

June 8, 1892.

Meeting called to order by Dr. Lee, chairman.

The report of the meat question was called for.

Dr. Reed read the report.

He suggested that the committee to be appointed under the report, if any is to be appointed, ought to be comprised of members living near the slaughter houses.

Dr. Cochran expressed a desire that the report be well discussed. He said we ought to consider the question carefully. The United States government is concerned, large interests are involved. For this reason we should go carefully and be certain of our facts before acting. He said he had his doubts about the wisdom of making an inspection at all. There is filth and filth, much filth that is objectionable as a matter of sentiment, is not objectionable as a matter of health. The first question is, what makes beef products unwholesome? This must be determined first. Until we know what to do we ought to act carefully.

Dr. Reed replied: The part which the government plays ought not to influence us. We are here as sanitarians. The work is new and defective, hence we ought to look into it and give our advice as sanitarians and our aid. We should investigate the matter and see how the law is carried out, and in what way the law might be enforced.

Dr. Hibbard said that he did not see how we can proceed in an investigation without having something to base an investigation on. The animal that is slightly unhealthy may nevertheless be healthy food. He was willing to go so far in this matter as to look for further information on the subject, but thought it would be better to be certain of the facts before going any farther.

Dr. Lee asked for an expression as to how many should go on the committee.

It was decided to place the number at five.

Dr. A. N. Bell, of Brooklyn, read a paper on "Needful Legislation for the Protection of Human Life."

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Dr. Comegys opened the discussion. He said that all Dr. Bell said about the necessity of disinfecting ships, etc., must be admitted, but he differed somewhat with Dr. Bell as to the means to be employed to bring about the desired result. The question is, can they be disinfected by the State? It is a question of executive power. Which would be most efficient, a department of public health, or some other department, such as the department of war? The question should be left with the medical men. The medical profession is in the best position to know what is needed in preventive medicine. The quarantine department cannot cope with this entire question. The Board of Health has been a failure in this matter. Public welfare is closely connected with the practice of medicine. We need a department of public health. It would bring about reform in medical education.

Dr. Formento said that while he agreed with Dr. Bell in most points there are some things he cannot allow to go by without a protest. He believes that State Boards of Health can in themselves cope with the question. New Orleans has kept out disease since 1878 on her own resources.

Dr. Cochran said he had a few ideas upon this question which he desired to present. He would be glad if a law could be passed to create a department of public health. He did not believe that Congress would even give the matter serious consideration at present. We might do better by asking less. It might be well to ask for a commissioner of health. He said he had reason to believe that a bill could be passed creating the office. He would suggest that if there is ever a commissioner of public health, he ought to annually call a conference of officers of boards of health to consult them. There has been a great tendency to interfere with the functions of State Boards of Health.

Dr. Wyman said that if it is thought there are no quarantine laws he felt called upon to explain the situation. There are eight quarantine stations at present, that is, eight national stations. Most of these are or are becoming places of refuge. The relations between the national and local stations are most cordial. So great is the fear of yellow fever in the South that during the hot weather the southern cities require all ships whether infected or not to be disinfected if they come from questionable ports. A bill has been introduced to perfect the quarantine laws; this will not intrench upon the boards of health.

Dr. Comegys desired to say further that nothing has been done to interfere with the quarantine department or the boards of health, in the effort that has been made to secure the appointment of a commissioner of health. He then read a circular on the subject.

Dr. Bell, in closing the debate, said he did not want to interfere with the boards of health, but to better organize them. He wants to arraign our government for neglecting the health of the people. We need a national health department that will coördinate with State boards.

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On motion, Dr. Bell's paper was referred to the Committee on Printing.

In addition to the names recorded before as having been registered, there are those of A. J. Fuller and T. B. Greenley.

Dr. Crothers read his paper on "The Sanitary Side of the Drinking Question."

Dr. Cochran in discussing Dr. Crothers' paper said he thought the suggestions made in the paper were well worthy of consideration.

Dr. Hibbard said he approved of the beginning and ending of the paper, but condemned the middle. It is a great mistake to suppose that drunkards can be cured by imprisonment. There is some benefit in imprisonment however. He does not believe in abolishing saloons, but in taxing them in order that good would be acomplished. Reformatories ought to be supported by this tax.

June 9, 1892.

Section called to order by Dr. Lee at 2:30 p. m.

Dr. Flick spoke on "The Voluntary Association for the Prevention of Tuberculosis."

Dr. Duffield said that the question of contagion underlaid the subject under discussion. He thought that climate ought not to be overlooked. He thought cold played an important part in the etiology of the disease.

Dr. Ulrich said the remarks of the gentleman who had just spoken were very apropos, but in this section we can only take advantage of those things at our command. Poor people cannot take advantage of a change of climate. There is great carelessness in the distribution of tubercular sputa. In this there is need of education.

Dr. Cochran said: I did not hear the paper read and possibly the questions I will ask have been answered. I would like to know what the members of this section consider the principal avenue of introduction into the system of tuberculosis.

Dr. Cutter said he believed it was the object of the section to get the views of all the members. He believed the principal avenue of introduction to be by the stomach.

On motion, adjourned until June 10, at 9 a. m.

June 10, 1892.

Meeting called to order by Dr. Cochran in the absence of Dr. Lee.

A paper on "Kumyss" by Dr. Mont Bleyer, of New York city, was read by its title and referred to the Committee on Publication.

Committee on meat packing establishments, Drs. R. Harvey Reed, Mansfield, Ohio; J. F. Hibbard, Richmond, Indiana; W. L. Schenck, Topeka, Kansas; R. E. Starkweather, Chicago, Ill.; U. O. B. Wingate, Milwaukee, Wis.

Dr. Francis H. Atkins, of New Mexico, read a paper on "A Bird's Eye View of New Mexico."

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Paper of Dr. Atkins referred to the Committee on Publication.

Resolutions were offered regarding the pollution of sewers; they were read and laid upon the table.

It was moved and seconded, that the officers of this section be instructed to confer with the Section on Dietetics and Medical Jurisprudence with a view of consolidating the three sections, and report at the next meeting.

Motion to adjourn *sine die*, carried.

LAURENCE F. FLICK,
Secretary.

BENJAMIN LEE, M. D.,
President.

REPORT OF THE SPECIAL COMMITTEE TO DEVISE A PLAN TO PURSUE IN THE INSPECTION OF THE PACKING HOUSES OF THIS COUNTRY.

Your committee beg leave to report that they would respectfully recommend:

1. That a committee of not less than three nor more than five be appointed by the chairman of this section, who shall conduct an inspection of the packing houses of this country, which inspection shall be conducted solely in the interests of the public health, and at the same time shall observe that due care be taken not to unnecessarily interfere with the commercial interests of the same.

2. That this committee be instructed to especially investigate the protection provided against the marketing of trichinous or other diseased meat.

3. That this committee shall be instructed to use all practical diligence to obtain the co-operation of the Bureau of Animal Industry and the management of the various Abbatairs in question, to secure all the general and practical information possible regarding this important question and report the same to this section.

4. That the preamble and resolution offered by Dr. R. Harvey Reed on "The Meat Problem of this Country" be laid upon the table until next year.

Very respectfully submitted.

R. HARVEY REED,
Chairman.
RALPH E. STARKWEATHER,
JEROME COCHRAN.

Dr. Cochran favors the plan outlined in the report of the committee if an inspection is to be made, but has grave doubts as to the propriety of making any inspection at all.

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THE MEAT PROBLEM OF THIS COUNTRY.

WHEREAS, This is pre-eminently a meat-eating country, and that the greater portion of meat supplied our citizens is now slaughtered at the so-called "packing houses" of this country and transported, by rail or otherwise, in various forms, to the numerous markets of our cities; and,

Whereas, This trade has become so enormous that in one year alone 1,750,000 hogs, and 750,000 cattle, besides calves and sheep, were slaughtered and shipped to various parts of our country, as well as to foreign countries, by one firm alone; and,

Whereas, The Federal Government, on March 3, 1891, enacted a law to provide for the inspection of live cattle, hogs, and carcasses and products thereof, which are the subjects of interstate commerce, and for other purposes, and have placed this inspection in the care of a bureau, under the Department of Agriculture (a copy of which law is herewith attached, together with the rules and regulations for the inspection of live stock and their products, issued by Secretary Rusk); and,

Whereas, These inspections have largely been confined to the export trade, and the meat so exported sent out under an official seal of this government; and,

Whereas, It has come to our notice that said meat so imported to for eign countries has been found to be diseased, saying nothing of the meat that has not undergone inspection and which has been sold to the citizens of this country; and,

Whereas, It is claimed by the Department of Agriculture that the microscopists, who make these examinations, are only expected to examine fifty animals, of which they are required to make two examinations, cut their own sections and make their reports; and,

Whereas, As by personal inspection by the writer it has been ascertained to his personal knowledge that ten microscopists were required to examine 800 hogs in a single day, on which two examinations had to be made, making in all 1,600 examinations, or an average of 160 microscopic examinations and reports for each microscopist; and,

Whereas, The anti and post-mortem examination of over 1,200 cattle, 800 hogs, 500 to 600 sheep, and as many calves, were required to be made by four veterinary surgeons; therefore, be it

Resolved, That this section consider it a practical impossibility to make this number of inspections with accuracy by the number of examiners employed; and that it is detrimental to the public health to permit of the wholesale slaughter of animals and the general sale of such meat in the manner in which it is now done, without competent and complete inspections; and, further be it

Resolved, That it is not to the interest of the government to allow its brand to be placed on meat which has not been thoroughly inspected, in such a manner as to bear the most critical examination that may afterwards be made; and, further be it

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Resolved, That this section appoint a committee of not less than three or more than five, who are willing to assume this work, and that they be requested to make a personal investigation of the packing houses of this country, the manner of inspection, the kind of meat killed, its classification, the manner of shipping it, the manner in which it is prepared and such other information as may be of public interest, and report the same to this section.

Very respectfully submitted.

R. HARVEY REED, M. D.,
Mansfield, O.

Regulations for the Inspection of Live Stock and their Products.

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
WASHINGTON, D. C., *March 25, 1891.*

The following rules and regulations, being additional to the rules and regulations heretofore made under the act of Congress approved August 30, 1890, are hereby prescribed for the inspection of live cattle, hogs and their carcasses, by virtue of the authority conferred upon the Secretary of Agriculture under the provisions of the act of Congress approved March 3, 1891, entitled "An act to provide for the inspection of live cattle, hogs and the carcasses and products thereof which are the subjects of interstate commerce, and for other purposes."

1. *Export Cattle Inspection.* The order and regulations providing for the inspection of export cattle and sheep, made October 20, 1890, under the provisions of section 10 of the act of Congress approved August 30, 1890, are hereby continued in full force and effect, the same as if made under the provisions of the act of March 3, 1891, and all exporters, to secure clearance for their shipments of cattle, must comply strictly with the said regulations.

2. *Meat Inspection.* The proprietors of slaughter houses, canning, salting, packing or rendering establishments, engaged in the slaughter of cattle, sheep or swine, the carcasses or products of which are to become subjects of interstate or foreign commerce, will make application to the Secretary of Agriculture for inspection of said animals and their products.

3. The said application must be in writing, addressed to the Secretary of Agriculture, Washington, D. C., and shall state the location and address of the slaughter house or other establishment, the kind of animals slaughtered, the estimated number of animals slaughtered per week, and the character and quantity of the products to go into the interstate or foreign commerce from said establishment; and the said applicant in his application shall agree to conform strictly with all regulations or orders that may be made by the Secretary of Agriculture for carrying on the work of inspection at such establishment.

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4. The Secretary of Agriculture, upon receipt of said application and after consideration thereof, will give said establishment an official number, by which all its inspected products will thereafter be known, and this number will be used both by the inspectors of the Department of Agriculture, and by the owners of said establishment, to mark the products of the establishment as hereinafter prescribed.

5. The Secretary of Agriculture will appoint and designate a veterinary inspector to take charge of the examination and inspection of animals and their products for each establishment which has been officially numbered, as prescribed by rule 3, and will detail to such inspector such assistants or other employes as may be necessary to properly carry on the work of inspection at said establishment. The inspector appointed, and all employes under his direction, shall have full and free access at all times to all parts of the building or buildings used in the slaughter of live animals and the conversion of their carcasses into food products.

6. The veterinary inspector in charge of said establishment will carefully inspect all animals in the pens of said establishment about to be slaughtered, and no animal shall be allowed to pass to the slaughtering room until it has been so inspected. Whenever any animal is found on said inspection to be diseased, said animal shall thereupon be condemned by the inspector, and the owner of the same shall at once remove it from the premises and dispose of it in such manner as may be provided by the laws of the State in which said animal is located.

7. The veterinary inspector or his assistant shall carefully inspect at time of slaughter all animals slaughtered at said establishment and make a post-mortem report of the same to the department. Should the carcass of any animal, on said post-mortem examination, be found to be diseased and unfit for human food, the said carcass shall at once be removed from said establishment under the supervision of the inspector and be disposed of in the manner provided by the laws of the State where slaughtered. Any owner of any establishment in which inspections are being made under the provisions of the act of March 3, 1891, who shall wilfully cause or permit any animal which, upon inspection, has been found to be diseased to remain on said premises beyond the time allowed by the inspector in charge for its removal, shall forfeit his right to inspection, and said establishment will, for such time as the secretary may direct, be refused certificates of inspection upon its products.

8. The carcasses of cattle which leave said establishment as dressed beef will be stamped by said inspector with a numbered stamp issued by the Department of Agriculture, and a record of the same will be sent to the Department at Washington.

9. Each and every article of food products made from the carcasses of animals inspected will be labeled or marked in such manner as the owner of said establishment may direct; said label, however, must bear the of-

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ficial number of the establishment from which said product came and also contain a statement that the same has been inspected under the provisions of the act of March 3, 1891.

A copy of said label must be filed at the Department of Agriculture, Washington, D. C., and, after filing, said label will become the mark of identification showing that the products to which it has been attached have been inspected, as provided by these rules and regulations, and any person who shall forge, counterfeit, alter, or deface said label will be prosecuted under the penalty clause of section 4 of the act of March 3, 1891.

Each and every package to be shipped from said establishment to any foreign country must have printed or stenciled on the side or on the top, by the packer or exporter, the following:

FOR EXPORT.

(*a*) Official number of establishment.
(*b*) Location of factory.
(*c*) Number of pieces or pounds.
(*d*) Trade-mark.

In case said package is for transportation to some other State or Territory or to the District of Columbia, in place of the words "for export" the words "interstate trade" shall be substituted.

The letters and figures in the above print shall be of the following dimensions: The letters in the words "For Export" or the words "Interstate Trade" shall not be less than three-fourths of an inch in length, and the other letters and figures not less than one-half inch in length The letters and figures affixed to said package shall be legible and shall be in such proportion and of such color as the inspector of the Department of Agriculture may designate.

10. The inspector of the Department of Agriculture in charge of said establishment, being satisfied that the articles in said packages came from animals inspected by him, and that they are wholesome, sound and fit for human food, shall affix to the top of said packages meat inspection stamps to be furnished by the Department of Agriculture, said stamps bearing serial numbers, and the inspector will write on said stamps the date of inspection.

The stamp must be securely affixed by paste and tacks in such a way as to be easily read when the package is standing on its bottom. Not less than five tacks shall be driven through each stamp, one at each corner and one in the middle of the stamp.

The stamp having been affixed, it must be immediately canceled. For this purpose the inspector will use a stencil plate of brass or copper, in which will be cut five parallel waved lines long enough to extend beyond each side of the stamp on the wood of the package. At the top of said stencil will be cut the name of the inspector and at the bottom of said stencil will be cut the district in which the inspection is made.

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The imprinting from this plate must be with blacking or other durable material, over and across the stamp, and in such a manner as not to deface the reading matter on the stamp, that is, so as not to daub and make it illegible. The stamp having been affixed and canceled, it must immediately be covered with a coating of transparent varnish or other substance. Orders for stamps must be made by the inspector on the Chief of the Bureau of Animal Industry.

11. Whenever any package of meat products bearing the stamp of inspection shall have been opened and its contents removed for sale the stamp on said package must be effaced and obliterated from the package.

12. Reports of the work of inspection carried on in every establishment will be forwarded to the department by the inspector in charge, on such blank forms and in such manner as will be specified in "instructions to inspectors of slaughtering establishments."

13 *Swine.*—The inspection of swine for export or interstate trade will be conducted in the same manner as prescribed in the foregoing rules, with the addition, however, that a microscopic examination for trichina will be required for all swine products.

14. When the slaughtered hog is passed into the cooling room of said establishment, the veterinary inspector in charge, or his assistants, will take from each hog two samples of muscle, one from the "pillar of the diaphragm" and the other from another part of the body, and said samples will be put in a self-locking tin box and a numbered tag will be placed upon the hog from which said samples have been taken and a duplicate number of said tag will be placed in the box with said samples. The boxes containing the samples from the hogs in the cooling room, so tagged, will be taken to the microscopist for such establishment, who shall thereupon make a microscopic examination of each box containing samples, and shall furnish a written report to the inspector in charge of the cooling room, giving the result of said microscopic examination, together with the numbers of the hogs from which samples have been examined.

15. All hogs reported by the microscopist to the inspector in charge of the cooling room to be affected with trichina will at once be removed from said cooling room of said establishment under the supervision of said inspector or one of his deputies, and be disposed of by the owner in such a manner as may be required by the laws of the State where said factory is situated.

16. The inspector in charge of the slaughtering or other establishment will issue a certificate of inspection for all carcasses of animals or the food products thereof which are to be exported into foreign countries, which certificate will cite the number of the factory, the name of the owner or owners operating the same, the date of inspection, and the name of the consignee and country to which said articles are to be exported. Said certificate will also contain the numbers of the stamps at-

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tached to the articles to be exported. One certificate only will be issued for each consignment. The certificates will be issued in serial numbers and in triplicate form. One copy thereof will be delivered to the consignor of such shipment, one copy will be attached to the invoice or shipping bill to accompany the same and be delivered by the transportation companies to the chief officer of the vessel upon which said consignment is to be transported, and the third copy will be forwarded to the Department of Agriculture for filing therein.

J. M. RUSK,
Secretary.

An act to provide for the inspection of live cattle, hogs and the carcasses and products thereof which are the subjects of interstate commerce, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Agriculture shall cause to be made a careful inspection of all cattle intended for export to foreign countries from the United States, at such times and places, and in such manner, as he may think proper, with a view to ascertain whether such cattle are free from disease; and for this purpose he may appoint inspectors, who shall be authorized to give an official certificate clearly stating the condition in which such animals are found, and no clearance shall be given any vessel having on board cattle for exportation to a foreign country unless the owner or shipper of such cattle has a certificate from the inspector herein authorized to be appointed, stating that said cattle are sound and free from disease.

SECTION 2. That the Secretary of Agriculture shall also cause to be made a careful inspection of all live cattle the meat of which is intended for exportation to any foreign country, at such times and places, and in such manner, as he may think proper, with a view to ascertain whether said cattle are free from disease and their meat sound and wholesome, and may appoint inspectors, who shall be authorized to give an official certificate clearly stating the condition in which such cattle and meat are found, and no clearance shall be given to any vessel having on board any fresh beef for exportation to and sale in a foreign country from any port of the United States until the owner or shipper shall obtain from an inspector appointed under the provisions of this act such certificate.

SECTION 3. The Secretary of Agriculture shall cause to be inspected, prior to their slaughter, all cattle, sheep and hogs which are subjects of interstate commerce and which are about to be slaughtered at slaughter houses, canning, salting, packing or rendering establishments in any State or Territory, the carcasses or products of which are to be transported and sold for human consumption, in any other State or Territory or the District of Columbia, and in addition to the aforesaid inspection, there may be made in all cases where the Secretary of Agriculture may deem necessary or expedient, under the rules and regulations to be by

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him prescribed, a post-mortem examination of the carcasses of all cattle, sheep and hogs about to be prepared for human consumption at any slaughter house, canning, salting, packing or rendering establishment in any State or Territory, or the District of Columbia, which are the subjects of interstate commerce.

SECTION 4. That said examination shall be made in the manner provided by rules and regulations to be prescribed by the Secretary of Agriculture, and after said examination the carcasses and products of all cattle, sheep and swine found to be free of disease, and wholesome, sound and fit for human food, shall be marked, stamped, or labeled for identification as may be provided by said rules and regulations of the Secretary of Agriculture.

Any person who shall forge, counterfeit or knowingly and wrongfully alter, deface or destroy any of the marks, stamps or other devices provided for in the regulations of the Secretary of Agriculture, of any such carcasses or their products, or who shall forge, counterfeit or knowingly and wrongfully alter, deface or destroy any certificate provided for in said regulations, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine not exceeding one thousand dollars, or imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

SECTION 5. That it shall be unlawful for any persons to transport from one State or Territory or the District of Columbia, into any other State or Territory or the District of Columbia, or for any person to deliver to another for transportation from one State or Territory or the District of Columbia into another State or Territory or the District of Columbia the carcasses of any cattle, sheep or swine, or the food products thereof, which have been examined in accordance with the provisions of sections three and four of this act, and which on said examination have been declared by the inspector making the same to be unsound or diseased. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor and punished for each offense as provided in section four of this act.

SECTION 6. That the inspectors provided for in sections one and two of this act shall be authorized to give official certificates of the sound and wholesome condition of the cattle, sheep and swine, their carcasses and products described in sections three and four of this act, and one copy of every certificate granted under the provisions of this act, shall be filed in the Department of Agriculture, another copy shall be delivered to the owner or shipper, and when the cattle, sheep and swine, or their carcasses and products are sent abroad, a third copy shall be delivered to the chief officer of the vessel on which the shipment shall be made.

SECTION 7. That none of the provisions of this act shall be so construed as to apply to any cattle, sheep or swine slaughtered by any

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farmer upon his farm, which may be transported from one State or Territory or the District of Columbia into another State or Territory or the District of Columbia: *Provided, however*, That if the carcasses of such cattle, sheep or swine go to any packing or canning establishment and are intended for transportation to any other State or Territory or the District of Columbia as hereinbefore provided, they shall there be subject to the post-mortem examination provided for in sections three and four of this act.

Approved, March 3, 1891

ADDRESS OF THE CHAIRMAN—RESPONSIBILITY OF THE NATIONAL AND STATE GOVERNMENTS FOR THE PROTECTION OF THE PURITY OF THE WATER SUPPLIES.

By BENJAMIN LEE, M. D., *of Philadelphia.*

Before entering upon the consideration of the question announced as the subject of my address, to which I shall ask your attention for but a few moments, it seems fitting that a brief allusion should be made to the question of the re-organization of the parent association of which this body is one of the members, in the interest of scientific work as contrasted with the transaction of routine business and the reading of essays on abstract subjects. No one who has attended the meetings of the association with any degree of regularity for the past ten years can have failed to observe the growing importance of the sections and the hold which they have on the interest of the members. To such an extent is this true that a writer in the *American Lancet* has not hesitated to formulate the terse phrase "The sections are the association." If this be admitted the step is an easy one to the further assertion. "The sections should control the association." The chairman of the section of ophthalmology at the meeting the last year devoted his address to indicating in what way the sections *might* "control the association," and courteously sent a copy of his address to the chairman of this and, it is presumed, of every other section, if not to all the members of the association. At the last meeting of this section a committee of three was appointed to confer with similar committees to be appointed by the other sections, to take up the whole subject of the development of the sections. A place has been given in the program for the report of this committee and an opportunity will then be presented for full discussion of this important movement.

The proposal of the chairman of the ophthalmological section would, as it seems to me, to a great extent do away with the judicial council as at present constituted, as also with the nominating committee, and

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place all the business now discharged by those bodies in the hands of a council composed of ex-chairmen of sections for the three preceeding years.

It is claimed that this plan would give the smaller an equal representation, in the general administration of the affairs of the association with larger sections, and that the members of such a council would be thoroughly familiar with the needs and interests of the sections. This would practically put an end to the system of geographical representation which has heretofore been warmly cherished by a large portion of the association, and which they may feel loath to abandon. While seeing much in the scheme to approve, two objections occur to me which I feel are entitled to consideration. First, the work of the judicial council is often large in amount and exacting in character. The ex-chairmen of a section are apt to be earnest workers in the section and contributors to its program and discussions. If this labor is assigned to them, is it not possible that it may prove so engrossing as to take them away from the section sessions, and thus diminish the interest of the latter? Secondly, eight out of the eleven sections are composed of men who are more or less strictly specialists. Of course it is gratifying and instructive to them to meet those who are following the same lines of work, to become acquainted with them personally, to exchange ideas with them, and profit mutually by one another's experiences, efforts and discoveries. But, if only such as are thus bound together by ties of business interest, and it must be confessed after all that section work has its business aspect to a very considerable degree, are to meet one another, listen to one another, talk to one another and eat and drink with one another, will not the effect be to increase the narrowness of the professional and intellectual horizon, which their daily routine necessarily involves, instead of broadening the view and widening the field of thought, as one would like to feel to be the result of annual association with the great mind of every branch of the profession. For this latter reason the proposal that each section should have a stated social gathering of its own should not be too hastily adopted. The idea of having the proceedings and papers of each section reprinted from The Journal of the Association on fine paper with cloth binding would probably entail greater expense on each individual member in a small section like ours than in a large one. It is, however, well worthy the attention of the members. And just here it may not be out of place to advert briefly to a disadvantage under which our section labors. Nearly all its members are engaged in the active practice of medicine or surgery. The work which they do here and the time which they bestow, contribute in no way to their knowledge of the particular department of medical science or art to which they devote themselves and on which they depend for a livelihood. They know that in many other sections papers are being read which would convey to them

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information of inestimable value, and discussions participated in by men to whom their ears are burning to listen. They are with us, therefore, at no trifling personal self-sacrifice. Hence, it can never be otherwise but that attendance on our sessions should be limited in numbers and fluctuating in character. Would it not be well to accept this fact and govern ourselves accordingly?

This thought has been in the minds of the officers in arranging the program of the present meeting, certain available periods having had no session assigned them, in order to allow the opportunity for attendance on these of other sections.

GOVERNMENTAL RESPONSIBILITY FOR THE PROTECTION OF WATER SUPPLIES.

The question of the pollution of streams and other sources of water supply on this continent is rapidly assuming the greatest gravity. It is curious to notice how in this, as in moral and social problems, we are gradually making the discovery that America is after all not very different from the rest of the world, and that measures which have been found necessary in the older civilizations for the maintenance of public peace, the fostering of morality and the preservation of the public health, must also eventually be resorted to by us.

The first lesson which we learned on this question was that of the possibility of the pollution of wells, and a hard lesson it was, and still is, to drive into the head of the farmer or villager, who looks upon his well or spring or pump as a sacred legacy from his ancestors, hallowed by their use for generations, and to doubt the purity of which is to cast a reflection on the character of those who have gone before. The "old oaken bucket," notwithstanding the admirable parody on it by a well known sanitarian, still holds a place in the affections of the people which wins for it the plaudits of an enthusiastic public, wherever the "Old Homestead" is put upon the State. This idol, however, is rapidly being shattered. Next in order we have been compelled to abandon our faith in the pure mountain stream that comes sparkling and dancing down the hill-sides. Plymouth gave the death blow to this article of belief, but it dies hard. Then the cherished doctrine of the self-purification of streams in the course of a flow of twelve miles was reluctantly abandoned. Finally a careful study of the statistics of our lake cities by Dr. Peter H. Bryce, Secretary of the Provincial Board of Health of Ontario, recently presented before the State Sanitary Convention of Pennsylvania as the Annual Address before the Board, shows conclusively that large bodies of fresh water, however pure by nature, cannot be depended upon to neutralize the germs of disease poured into them by large populations. All of these dis-illusions have in turn aroused public attention to the necessity of warding off the corresponding dangers, and have thus resulted in the formulation of legislative enactments of more or less wisdom and efficiency, generally more wise and

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efficient as their authors have profited by the experience of foreign countries in their construction.

In other words physical nature like human nature is the same all the world over, and it only requires the presence of the necessary amount of human nature sufficiently condensed to develop invariably certain conditions in physical nature which must be heeded. We are a great people and America is a great country, but even the great American eagle must bow in humility before the universal laws of nature. The problems which are now confronting us in consequence of our rapidly increasing population have forced themselves for many years on the attention of thoughtful minds in England and on the continent of Europe.

It would be then the utmost folly not to avail ourselves of the labor and thought which they have expended upon them. As is well known, the result of such study in Great Britain has led to the establishment of a body known as the "Conservancy Commission," whose duty is to investigate the reality and extent of this alleged evil of pollution of water supplies and to devise means for its remedy. I feel convinced that such a step is rapidly becoming a necessity in this country. To marshal statistics before this section in order to convince its members that throughout the entire nation, in villages as well as in cities, thousands of avoidable deaths are taking place every year, in consequence of the pollution of public water-supplies, or that the ratio of comparative purity of water supplies and comparative rate of mortality is almost a constant one, would, I feel, be a work of supererogation. I take that entirely for granted and do not anticipate the expression of a doubt on the subject. The questions naturally suggest themselves, then, "What are the several State governments doing to protect the purity of public water supplies?" and "To what extent are the State governments capable of preventing the pollution of streams, many of which traverse a large number of States?" This last questio is to be considered on its moral as well as physical side. For, while a State government may in the abstract possess the power to prevent the contamination of a stream passing from its territory into that of another State, in the concrete it may find itself quite unable to refute the logic of those who are interested financially in maintaining contamination. I think it will be held to be sound law that no State has a right to pollute or poison a source of water supply passing into another State any more than an individual has to pollute or poison his neighbor's well. If this be admitted, then, if State governments fail to appreciate their responsibilities in this particular, aggrieved States will have no resource but to petition Congress to enact such legislation as will take the matter out of the hands of the State governments and place it as a question of National hygiene, in those of the National government. In order to furnish data for the commencement of the investigation of this problem, I, some few months since, formulated a brief series of questions addressed to the secretaries of State Boards of Health as follows

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Secretary State Board of Health of

. . . . . .

DEAR DOCTOR: Shall I be trespassing too much upon your valuable time, if I request brief replies to the following interrogatories?

1. Has your State any laws prohibiting the pollution of streams or other inland waters?

2. Has your Board adopted any regulation upon this subject?

3. If either or both, kindly send me copies of the same if procurable?

4. Do any streams enter or traverse your State which have become seriously polluted in other States?

5. Do any streams which have become seriously polluted in your State enter or traverse other States?

6. In your opinion is it wise or politic to attempt to preserve the purity of streams, or should we not rather all w them to be used as sewers and seek our supplies of drinking water rom other sources?

7. If you favor the former alternative, do you consider it expedient, in view of the fact that so many of our streams ass from one State into another to petition Congress for the passage of a law forbidding the pollution of streams throughout the entire country, and establishing a "Rivers Conservancy Commission" for the purpose of enforcing such law?

Awaiting a reply to the above inquiries, at your convenience,

Yours very respectfully,

BENJAMIN LEE,
Secretary State Board of Health of Penn.

1532 PINE ST., *January 18, 1892.*

An analysis of the replies kindly sent by the secretaries of twenty-three boards gives the following results:

In reply to question No. 1. "Has your State any laws prohibiting the pollution of streams or other inland waters?"

The following named States and Provinces possess general legislative enactments for the preservation of the purity of water supplies and streams or other collections of water: Kentucky, Delaware, Wisconsin, New York, Massachusetts, Minnesota, Maryland, West Virginia, New Jersey, Ontario, Quebec, Illinois, California. In all thirteen.

The following named State posseses special legislative enactments for protecting the purity of the water supplies of certain cities only: Pennsylvania.

In the following named States and Provinces the legislatures have made it the duty of the State Board of Health to protect the purity of the water supplies, and conferred upon them powers more or less complete for performing this duty: Delaware, New York, Ontario, Quebec, Minnesota, Massachusetts. In all six.

The States of Minnesota and New York are those of the United States which have adopted what appears to me the most stringent and practi-

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cal laws upon this subject, and time will not be lost in rehearsing their important features. That of Minnesota, founded on the original law of Massachusetts which has since been considerably modified, is as follows:

An act to prevent the Pollution of Rivers and Sources of Water Supply.—Chapter 225, Laws of 1885.

To be enacted by the Legislature of the State of Minnesota.

SECTION 1. No sewage, drainage or refuse or polluting matter of such kind as either by itself or in connection with other matter will corrupt or impair the quality of the water of any spring, well, pond, lake, stream or river for domestic use, or render it injurious to health, and no human or animal excrement shall be placed in or discharged into, or placed or deposited upon the ice of any pond, lake, stream or river, used as a source of water supply by any town, village or city; nor shall any such sewage, drainage, refuse or polluting matter or excrement be placed upon the banks of any such pond, lake, stream or river, within five miles above the point where such supply is taken, or into any feeders or the banks thereof, of any such pond, lake, stream or river.

SECTION 2. The State Board of Health shall have the general supervision of all springs, wells, ponds, lakes, streams, or rivers used by any town, village or city as a source of water supply, with reference to their purity, together with the waters feeding the same, and shall examine the same from time to time and inquire what, if any, pollutions exist, and their causes. In case of the violation of any of the provisions of section one (1) of this act, said Board may appoint a time and place for hearing parties to be affected, and shall give due notice thereof, as hereinafter provided, to such parties, and after such hearing, if in its judgment the public health requires it, may order any person or corporation, or municipal corporation to desist from the acts causing such pollutions, or to cleanse or purify the polluting substance, in such a manner and to such a degree as shall be directed by said Board, before being cast or allowed to flow into the waters thereby polluted, or placed or deposited upon the ice or banks of any of the bodies of water in the first section of this act mentioned. Upon the application of the proper officers of any town, village or city, or of not less than . . . legal voters of any such town, village or city, to said Board, alleging the pollution of water supply of any such town, village or city, by the violation of any any of the provisions of this act, said Board shall investigate the alleged pollution, and shall appoint a time and place, when and where it will hear and examine the matter, and shall give notice of such hearing and examination to the complainants, and also to the person or corporation, or municipal corporation alleged to have caused such pollution, and such notice shall be served not less than ten (10) days prior to the time so appointed, and shall be served in the same manner that now is, or hereafter may be by law provided for the service of a summons in a

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civil action in the district court. Said Board, if in its judgment any of the provisions of this act have been violated, shall issue the order or orders already mentioned in this section.

SECTION 3. The district court, or the judge thereof, may, upon the complaint of said Board, or of the proper authorities of any town, city or village, whose sources of water supplies shall be so polluted, issue an injunction to enforce the orders of said Board.

SECTION 4. Such orders of the State Board shall be served upon the persons, corporations or municipal corporations found to have violated any of the provisions of this act, and any party aggrieved thereby shall have the right to appeal to the district court of the county in which is situated the town, village or city, whose source of water supply is found to have been polluted, and such aggrieved party shall have the right to a trial by jury in the same manner as in a civil action in said court. During the pendency of the appeal, the pollution against which the order has been issued, shall not be continued contrary to the order of the State Board, and upon the violation of the order the appeal shall be forthwith dismissed.

SECTON 5. Any person, corporation or municipal corporation desiring to appeal from any such order of the State Board, shall within thirty (30) days after the service upon him or it, of a copy of such order, file in the office of the clerk of the district court of the proper county, a notice of such appeal, together with a bond in the sum of not less than two thousand (2,000) dollars, with two (2) sureties, to be approved by the judge of said court, conditioned for the prosecution of such appeal to judgment, and for the payment of all the costs and disbursements that may be adjudged against him or it therein, and shall, within three (3) days after such filling, serve a copy of such notice and bond upon the Secretary of the Board; said Secretary shall within ten (10) days thereafter, deliver such copies so served upon him to the mayor or other chief executive officer of any such city, village or town, whose source of water supply has been found to have been so polluted.

SECTION 6 Water boards, water commissioners, water companies and the proper officers of any city, village or town, making use as a source of water supply, of any well, spring, pond, lake, stream, river, reservoir or well, within, or partly within, this State, and distributing the waters thereof for public, domestic and general uses, shall, from time to time, and whenever required by said board, make returns to said board, upon blanks to be furnished by it, of such matters as may be required by said board and called for by such blanks, and any such water board, water commissioners, water company, or officers of any city, village or town, who shall for the space of thirty (30) days after being furnished with such blanks, fail or neglect to make any such report so required, shall for each and every such neglect or failure, forfeit and pay the sum of one hundred (100) dollars, for the use of the local board of health,

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or the proper officers acting as such, of the city, town or village where such delinquent has its principal office. Said State Board shall, in the name of the State, prosecute in the district court of the proper county an action for the recovery of the penalty or forfeit therein imposed.

SECTION 7. This act shall take effect and be in force from and after its passage.

Approved March 7, 1885.

That of New York, while efficacious for the prevention of pollutions of a minor character, is hampered by a restriction in regard to the purification of sewage or alteration of systems of sewerage, which at first sight would seem to largely deprive it of value. It reads as follows:

An act to confer upon the State Board of Health power to protect from contamination, by suitable regulations, the water supplies of the State and their sources. Passed June 13, 1885; chapter 543, Laws of 1885.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The State Board of Health is hereby authorized and empowered to make rules and regulations for protecting from contamination any and all public supplies of potable waters and their sources within this State. Provided, however, any such rule or regulation shall not be operative in any county until the county judge of that county shall approve the same.

SECTION 2. The said State Board of Health shall also have power, and it shall be its duty: 1. To publish once a week, for at least six consecutive weeks, all such rules and regulations as it shall have made concerning the contamination of any sub-soil waters, spring, streams, lakes, ponds, reservoirs, or other bodies of water contributing to the potable water supply of any municipality within this State, such publication to be made in one or more newspapers published in the county in which the waters affected by such regulations are located. The cost of publishing the regulations of the State Board of Health, as above provided, shall be paid by the corporation or municipality benefited by the protection of the water supply, concerning which the rules are made.

2. To impose penalties for the violation of, or the non-compliance with, their rules and regulations, not exceeding two hundred dollars in any one case.

SECTION 3. The officer or board having by law the management and control of the potable water supply of any municipality, in all cases where the said municipality derives its water supply in whole or in part from any subsoil water springs, streams, lakes, ponds, reservoirs, or other water concerning which the State Board of Health shall make any rule or regulation, is hereby authorized and empowered to make such inspection of the sources of said water supply as said officer or board may deem advisable to secure the said water supply from any defilement, and

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to ascertain whether or not the rules and regulations made by the State Board of Health are complied with.

SECTION 4. In case such inspection shall disclose the violation by any person or persons of any of the rules or regulations of the said State Board of Health relating to the sources of said water supply, the officer or board mentioned in section three of this act shall serve or cause to be served a copy of the said rules and regulations, accompanied by a notice specifying the rule or regulation claimed to have been violated, upon the said person or persons violating such rules or regulations. If the person or persons so served do not immediately comply with the said regulation, the said officer or board having charge of the water supply of the municipality affected thereby shall notify the State Board Health of the violation of its rules; the State Board of Health shall thereupon examine into the said violation, and if the party complained of is found to have actually violated any of the said regulations, the Secretary of the State Board of Health shall order the local board of health having jurisdiction thereof to convene and enforce obedience to the said regulation.

SECTION 5. In case any local board of health having jurisdiction thereof fails to enforce the order of the Secretary of the State Board of Health within ten days after the receipt of a notification so to do, as provided in the last section, the corporation furnishing the water supply, or the municipality deriving its water supply from the waters for the sanitary protection of which such rules have been made, is hereby authorized and empowered to maintain an action in a court of record and which shall be tried in the county in which the cause of action arose against the person or persons violating the said rules for recovery of the penalty therein provided.

SECTION 6. Every person who shall willfully violate or refuse to obey any rule or regulation made and published by the State Board of Health, and approved pursuant to the provisions of this act, shall be guilty of a misdemeanor, and on a conviction thereof shall be subject to a fine or imprisonment, or both, at the discretion of the court, such fine not to exceed three hundred dollars, nor such imprisonment six months. But the recovery of a penalty in a civil action, as provided in section five of this act and criminal prosecution and conviction under the provisions of this section, shall not be had for the same offense.

SECTION 7. When the State Board of Health shall, for the protection of a water supply from contamination, make regulations, the execution of which will require the providing of some public means of removal or purification of sewage, the **municipality or corporation owning the water works benefited thereby shall, at its own expense, construct* and maintain such works or means for sewage disposal, as shall be approved by the State Board of Health.

* Italicized by the writer.

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SECTION 8. The State Board of Health, any local board of health, or any municipality or corporation furnishing water, may cause the affidavit of the printer, publisher, or proprietor of any newspaper publishing the rules and regulations as provided by the second section of this act, to be filed with such rules as published in the clerk's office of the county in which the municipality or corporation furnishing the water supply in any case may be situated or located, and such affidavits and rules, or duly certified copies thereof, shall be deemed conclusive evidence of due publication and of all the facts therein stated in all courts and in all proceedings or prosecutions under the provisions of this act.

SECTION 9. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

SECTION 10. This act shall take effect immediately.

An act to amend chapter five hundred and forty-three of the laws of eighteen hundred and eighty-five, entitled "An act to confer upon the State Board of Health power to protect from contamination, by suitable regulations, the water supplies of the State and their sources," relative to the construction of systems of sewerage, and works for the removal and disposal of sewage and the removal of buildings, and giving a right of action for damages.

Approved by the Governor June 2, 1890. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section seven of chapter five hundred and forty-three of the laws of eighteen hundred and eighty-five, entitled "An act to confer upon the State Board of Health power, to protect from contamination by suitable regulations, the water supplies of the State and their sources," is hereby amended so as to read as follows:

SECTION 7. When the State Board of Health shall for the protection of a water supply from contamination, make regulations, the execution of which will require, or will make necessary, the construction and maintaining of any system of sewerage, or a change thereof, in any or for any village or hamlet, whether the same be incorporated or otherwise, or the execution of which will require the providing of some public means of removal or purification of sewage, the municipality or corporation owning the water works benefited thereby, shall, at its own expense, construct and maintain such system or systems of sewage, or change thereof, and also provide such means of removal and purification of sewage, and also such works or means for sewage disposal as shall be approved by the State Board of Health; and when the execution of any of the said regulations of the said State Board of Health will occasion or require the removal of any building or buildings, the municipality or corporation owning the water works benefited thereby, shall, at its own expense, remove said buildings and pay to the owner thereof all dam-

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ages occasioned by such removal; and when the execution of any such regulation will injuriously affect any manufacturing or industrial enterprise which is not a public nuisance, the said municipality or corporation shall pay all damages occasioned by the enforcement thereof. And until such construction or change of such system or systems of sewage, and such works or means for sewage disposal, and the removal of any building, is so made by the said municipality or corporation owning the water works to be benefited thereby, at its own expense, there shall be no action or proceeding taken against any person or corporation for the violation of any regulation of the State Board of Health under this act; and no person or corporation shall be considered to have violated or refused to obey any such rule or regulation. And the owner or owners of any building, the removal of which is occasioned or required or has been removed by any rule or regulation of the State Board of Health made under the provisions of this act, and all persons whose rights of property are injuriously affected by the enforcement of any such rule or regulation, shall have a right of action against the municipality or corporation owning the water works benefited by the enforcement of such rule or regulation, for all damages occasioned or sustained by such removal and enforcement of the said rule or regulation or either; and an action therefor may be brought against such municipality or corporation in any court of record in the county in which the premises or property affected is situated, and shall be tried therein.

SECTION 2. This act shall take effect immediately.

In reply to question No. 2. "Has your board adopted any regulation upon this subject?" In the following named States the State Board of Health has either by regulation, resolution or executive action attempted to protect the purity of inland waters: Massachusetts, Connecticut, West Virginia, New York, Delaware, Kentucky, Maryland, Wisconsin, Minnesota, Ontario, New Jersey, Illinois, California, Rhode Island, Province of Quebec, Pennsylvania. In all sixteen.

In reply to question No. 6. "Is it wise or politic to attempt to preserve the purity of streams, or should we not rather allow them to be used as sewers and seek our supplies of drinking water from other sources?"

The Secretaries of the following named States pronounced unequivocally in favor of making every effort to prevent the pollution of streams and, as far as possible, to keep all impurities from entering them, viz: Minnesota, Wisconsin, Vermoht, Kentucky, Delaware, New York, Province of Ontario, Missouri, North Carolina, Maryland, Province of Quebec. In all eleven.

The Secretaries of the following named Boards doubt the feasibility or possibility of preventing pollution to a very considerable extent, and therefore declare in favor of permitting streams to be used freely and unrestrictedly as sewers, and looking elsewhere for drinking water, viz:

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Alabama, Florida, Louisiana, Oklahoma Territory, Rhode Island, South Carolina. In all six.

The Secretaries of the following named State Boards considered that the question could not be answered categorically, but that each case of pollution or threatened pollution should be decided upon its merits as it arises: Massachusetts, California, Illinois, Connecticut, Michigan, West Virginia, New Jersey. In all seven.

In reply to question No. 7. "If you favor the former alternative, do you consider it expedient, in view of the fact that so many of our streams pass from one State into another, to petition Congress for the passage of a law forbidding the pollution of streams throughout the entire country, and establishing a Rivers Conservancy Commission for the purpose of enforcing such a law?"

The Secretaries of the following State Boards express themselves as in favor of National legislation forbidding the pollution of streams and establishing a Rivers Conservancy Commission for the purpose of enforcing such legislation: Louisiana, Delaware, Province of Ontario, Missouri, Maryland, South Carolina, Illinois, Connecticut, Michigan, West Virginia, Wisconsin, Vermont, Kentucky, Province of Quebec. In all fourteen.

Dr. N. D. Baker, of West Virginia, says: "I would join in earnestly urging the above action upon Congress."

Dr. F. W. Reilly, of Illinois, says: "The proposition to secure a Rivers Conservancy Commission, with power, authority and means to determine individual cases on the basis of individual conditions has my hearty endorsement."

Dr. C. W. Chancellor, of Maryland, says: "I am decidedly in favor of a 'Rivers Conservancy Commission' with strong laws to prevent pollution of any water-way. The general government will be forced at an early period to enact a law to protect the water supply of Washington city, which is already greatly polluted by the States of West Virginia, Virginia and Maryland. Congress alone can remedy the evil."

Dr. R. C. Atkinson, of Missouri, says: "I heartily approve of such a measure."

Dr. P. H. Bryce, of Toronto, says: "I think the suggestion that the question of the pollution of streams be taken up as a Congressional matter should be approved of and urged by all interested in State or international sanitation."

Mr. E. B. Frazer, of Delaware, says: "I heartily approve of the above. Protect the streams, keep them as the Almighty made them."

The Secretaries of the following State Boards are decidedly opposed to invoking the authority of Congress, believing that the separate States are fully capable of dealing with this problem: Rhode Island, Florida, Massachusetts, New Jersey, Minnesota, California.

It will thus be seen that the consensus of opinion of practical sanitarians is strongly in favor of legislative interference for the protection

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of the purity of water supplies and streams; that in several States such opinion has crystallized into a public sentiment of such force as to compel the unwilling acquiescence of legislators and lead to the passage of laws for the purpose; that as an ideal question all regard it favorably; but that, as a practical question, the varying conditions of the several States modify the opinions of those residing therein. In some instances the drainage problems of the country are such as to make it appear almost an impossibility to prevent the pollution of streams; in others the manufacturing interests are paramount to all other considerations; and in a third class, the country is so sparsely peopled and there is such an entire absence of manufacturing industries, that the question is not with them an urgent one. Wherever it has forced itself upon the attention of sanitarians, and the difficulties are not so great as to make them appear at first sight insurmountable, but one opinion has been entertained and expressed. This being the case, is it not desirable that this section should formulate a request to Congress to appoint a committee to consider the expediency of the establishment of a "National Rivers Convancy Commission," and transmit the same to the association with a recommendation for its adoption?

In coming to a decision on this really momentous question, it is in the highest degree desirable that we should allow hygienic considerations and the interests of human life alone to have weight! Shall we permit local jealousies or inherited prejudices or questions of political organization to influence us? Are not thinking men who reside in large cities beginning to wake up to the fact that so far as municipal government is concerned we have been grasping at the shadow of liberty only to lose the substance? Shall we allow the bogy of centralization of power to deter us from advocating a measure which may prove the salvation of thousands of lives?

THE NEED OF NATIONAL LEGISLATION FOR THE PROTECTION OF HUMAN LIFE.

By A. N. BELL, A. M., M. D.

The need of national legislation for the protection of human life is based upon the knowledge of the transmissibility of epidemic diseases by commerce.

This need obtains to a larger degree for the United States than for any other country in the world, because while the States severally have many inherent rights and obligations of their own, and among those rights certainly that of self-protection against dangers to human life, the nation alone has the power to regulate commerce; and because, related to this commerce, the United States greatly exceeds any other

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country in the world as the collective center of all nationalities and habits of life, more or less at variance with the conditions promotive of or in conflict with their own health or of the public health in this country.

Commerce, as hitherto conducted in the United States, in default of national legislation to prohibit the introduction of epidemic diseases has been and is in constant antagonism to the efforts of the States and their seaports to prevent their introduction. Hence, it may be truthfully asserted with regard to sanitary progress in this country, that it has not only been made for the most part without the aid of the general Government, but in actual contention against the Government practice in the contrary direction.

At the outset the general Government essayed to aid the seaports by providing hospitals for those sick with infectious diseases, and warehouses for infected merchandise, both of which commodities it has persistently supplied to the jeopardy of the public health and at great pecuniary cost to the people. It has fallen under my own observation that some such structures eventually became so dangerous that the people in their vicinity destroyed them; but some still exist at other seaports, memorials of the nation's efforts to co-ordinate the introduction of pestilential diseases with an unrestricted commerce in them. Fortunately, every State in the Union has the power to impose regulations for its own protection; and all—or as many of the States as may so agree—have the power to impose interstate regulations for mutual protection against the introduction and spread of epidemic diseases in their midst. Indeed, not only every State, but every municipality and corporate village or town, has similar power; and it has been in the exercise of such power by the corporate communities and the States severally, that, excepting the progress made in army and naval hygiene, and the work of the National Board of Health during its brief existence, all the progress in preventive medicine in this country has been made by the people in their own behalf against the fostering of disease by commerce. For this reason it is that there are not wanting some advocates of State and local sanitation exclusively as abundantly sufficient. And they would sustain the proposition by reference to the triumphs over preventable diseases by a large number of local boards of health throughout the country, particularly to the progress made under the auspices of the State Boards. Indeed, such advocates—looking at but one side of the question—might cite one of the most triumphant examples of sanitary progress on record to show the sufficiency of local effort alone when fully aroused.

It has been a favorite maxim with me for many years that progress in measures for the protection of human life primarily consists in exposing the consequences of their neglect. In 1864, six years before the first State Board of Health (that of Massachusetts in 1869) was established,

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I was privileged to belong to a voluntary association of citizens in New York,* whose members all appeared to me to be animated by the same sentiment—to seek out and publish the localizing causes of disease throughout the city. The report of the association at the end of that year showed that, in an estimated population of 700,000, 495,592 persons lived in tenement-houses and cellars, with an average of 7⅛ families to each tenement-house, and that many took boarders besides. The tenement-houses of one of the most thickly populated districts contained from ten to fifty families each. The *pro rata* of ground area to each occupant was less than fifteen square feet, and the space in the apartments to each occupant less than 300 cubic feet. One-half of the tenement-house population had less than 500 cubic feet of air space to each person. The filthy surroundings were loathsome in the extreme.

The total number of deaths reported for the year 1863 was 25,196—an increase of 3,952 upon the previous year; during the year 1864 there were several hundred more, and for the whole population a fraction less than one death annually to every thirty-five of the living.

For a period of twenty-five years, terminating at that time, the number of deaths reported by the city inspector annually had fluctuated from one death to every 39 to one for every 27, and had even been as high as one to every 22½ of the whole population; while among the most overcrowded tenement-house population it was one to every 19 of the living.

The outcome of that exposure was the establishment of the Metropolitan Board, in 1866. Under it and its subsequent modifications, cellar tenements have long since ceased to exist; the air space of the tenement-houses has been enlarged, by law, to not less than 600 cubic feet for each occupant; the death-rate of the city has been reduced to an average of about 24.5 per 1,000 of the whole population; and for the tenement-house population—counting in the advantage gained by an improved class of tenement-houses—the mortality has been less than among the non-tenement class—due, doubtless, to the better surveillance of the tenement-houses by the health department. On the whole, a reduction of about 10 per 1,000 of the population annually has been made in New York city since the establishment of the first scientific board of health there in 1866. The result since that time, as compared with a like period preceding the awakening of public attention and subsequent legislative action—brought about by the Citizens' Association—has been the saving of more than 500,000 human lives.

Again, the quarantine at the port of New York, aided (?) in the manner before indicated, and fed by commerce, had been, like the tenement-houses of the city, getting more and more deadly—proportional with patronage—until, in 1856, it reached a climacteric period.

The health officer's residence was at Tompkinsville, and the boarding

*Citizens' Association.

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place and anchorage in the Narrows, between Staten Island and the Long Island shore. In this narrow channel, from opposite the northern end of Staten Island, extending southward, and including Gravesend Bay, between Coney Island and Fort Hamilton, in the immediate trend of the prevailing southwest wind toward the Long Island shore, not more than 300 yards distant, there were anchored at one time during that summer over 200 infected vessels, chiefly with yellow fever. That the disease should have been communicated to the people in such proximity on the Long Island shore is perfectly consistent with the nature of such a mass of infected material everywhere. Moreover, it was through the midst of this accumulation of infected commerce that all vessels to and from the port of New York, for the time, had to pass.

But it was a blessed epidemic. It roused the people round about to the assertion of their rights, for which they did not cease to contend until the quarantine, as it was at that time conducted, was destroyed, and subsequently, by act of the Legislature, supplanted by the most efficient quarantine establishment in the world.

It would be an easy matter to cite other scarcely less signal triumphs of sanitation in the United States, independent of the several governments, equal to any that have taken place elsewhere during the now more than forty years since I have been not an wholly inactive observer. It is with knowledge limited to such progress in sanitation by the States and small communities that there are not wanting some men of influence wholly opposed to national legislation for the protection of human life. If the States and many populous communities severally have such power, and have used it with such good results as those illustrated by the examples cited, they ask, In what consists the necessity for national legislation?

First, because there is too much independent power on the part of State and municipal *officials*, and, above all, of merchants and their shipmasters, to do as they please, regardless of sanitary knowledge, or to ignore its importance when its exercise does not happen to harmonize with the political standard set up, or to chime in with money-getting propensities at the risk of the public health.

Of these, examples are by no means wanting. As one on a small scale, but exceedingly mischievous in its direction, the port of Perth Amboy, N. J., has been a thorn in the side of the New York quarantine and a menace to the health of the city ever since it became a port of entry. It claims the right—though not in so many words—and has frequently made attempts to exercise it (and not always ineffectually, there is reason to believe), to execute its privilege as a port of entry for infected vessels whose masters desire to shun the New York quarantine, by issuing a new clearance to New York, under the privilege of being a healthful port and a pur-blind health officer to the condition of the vessel.

But dangerous as such powers are, independent of even State control,

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they are insignificant as compared with some officials in higher places who would sacrifice the health of the State and nation to the opportunity for embarrassing a political opponent.

Every sanitarian in the Union knows that we have not far to seek for a prominent example in justification of these remarks; that for several years preceding the arrival of cholera-infected vessels at the port of New York in 1887 the quarantine establishment of New York had been allowed to decay and become notoriously deficient in means for the protection of the public health—in the face of universal intelligence that cholera was abroad—because the Governor of the State preferred to take the risk of a cholera epidemic rather than approve of legislative appropriations for preventive measures to be applied by those who differed with him in politics.

Unfortunately, this is not an isolated case, only in so far as it is the less excusable by reason of the prominence of the official and the consequently increased danger of a following. Indeed, this is already manifested by the action of his immediate successor, who has, for professedly economic reasons, just vetoed an appropriation for completing the repairs which his predecessor was driven to undertake by Mayor Hewitt and others of New York, when the amount asked for by the quarantine commissioners to complete the work would have increased the State tax *per capita* only *the sixth of one cent.*

The functions of the health officer of the port of New York, as with that of every port health officer in the United States, end with each case as it arises, while the recurrence of cases is continuous, a constant tax upon the port and the State, a menace to the public health, and an unmitigated burden to commerce.

Twenty-eight years ago at the meeting of this Association, at Boston, in 1865, I submitted a brief paper on the Introduction of Disease by Commerce. We have learned a good deal about the etiology of some commercial diseases since that time, but nothing to gainsay the force of the illustration then given, particularly with regard to yellow-fever, which is a constant menace to the southern section of our country, or of the pertinence of other infectious diseases introduced by commerce.

But that paper was evidently premature. And for that reason, fortified as it now is by increased observation and more general knowledge on the subject, an abstract of it is deemed appropriate to this occasion, as follows:

"Since yellow-fever appeared in the Brazils, about sixteen years ago" (it has now been forty-four), "it has extended over the entire Gulf of Mexico, the West Indies, and to most of the southern States, and finally to the Pacific Coast. But all the while it has clung with remarkable tenacity to regions and localities remarkable for general resemblance—for the time being, at least—in local and climatological conditions.

"In 1851–52 the harbor of Rio Janeiro was crowded with infected ves-

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sels, many of them destined for the Pacific. How many of them arrived there still infected, and touched at places where yellow fever soon after for the first time prevailed, we have no means of knowing. But a few have been traced.

"About the middle of the year 1851 the steamer New World, on her way to California, touched at Callao after having lost almost her whole crew by yellow fever in Rio. The steamer Quito also, during the same season, lost several of her crew there, proceeded to the Pacific, and arrived at Callao in April, 1852. Soon thereafter a mild form of fever broke out in Lima and along the coast of Peru, which the natives called 'pelusa,' just as in 1849 the precursory form of fever which prevailed in Rio was called 'polka.' The disease speedily developed into a perfect type of yellow fever, and has become domiciled.

"June 6, 1855, the steamer Ben Franklin arrived at Norfolk, Va., from St. Thomas, where she had lain several months during the prevalence of yellow fever, and had lost several of her crew with the disease, and had also lost two or three more with it on the voyage to Norfolk; but at the time of her arrival she had no one on board sick with it. On July 5, a man, who had been working on the boiler of the Ben Franklin two days before, was taken with yellow fever, and died on the fourth day of the disease. This was the starting point of the fever, which subsequently prevailed so extensively at Portsmouth and Norfolk until the beginning of cold weather.

"Early in December, 1857, the U. S. Steamer Susquehanna arrived at San Juan de Nicaragua from the Mediterranean two months before, touching by the way at Genoa, Madeira and Key West. She remained at San Juan until the first of the following April, having had during the whole time she laid there a constantly increasing sick list of a precursory fever. At first intermittent, then remittent, but all recovering until March 20, when a case became malignant and died.

"The ship put to sea April 1, and on the 5th arrived off Port Royal, Jamaica, with 106 officers and men down with yellow fever. Most of these were sent to the hospital, and on the third day afterward the ship sailed for New York, where she arrived April 15, with fifty-one on the sick list."

The remarkable feature in the case of the Susquehanna was that, at San Juan, where the yellow fever first broke out on board, there was no yellow fever at that place, and the disease had never been known to occur there. Moreover, the Susquehanna had been more than two years on service in the Mediterranean without having had any extraordinary sickness on board when she was ordered to San Juan de Nicaragua; but she had had yellow fever on board during her preceding cruise in the Gulf Squadron the summer before she was ordered to the Mediterranean, three years before. She was supposed to have been cleansed before she was so ordered, and owing to the unpredisposing conditions of the

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climate during the interval and while she remained on the Mediterranean station, to the revival of the yellow fever infection, which, as the sequel shows, she still retained until she returned to the conditions of the yellow fever habitat at the port of San Juan de Nicaragua.

It is contended by those who persist in their endeavors to elude every restriction upon commerce in disease by foul vessels, that there have been such improvements in ship architecture during recent years as to have well-nigh overcome such conditions as those cited. They would have us believe that because the modern iron ships and water ballast, which have taken the place of wood and stone, are more easily kept clean, they are less liable to infection than the ships of a past generation. But the continued and more certain propagation of epidemic diseases by commerce, and by emigrant ships particularly, is conclusive testimony against that contention. Indeed, admitting the improvements with regard to the passenger-carrying capacity of emigrant ships, such improvements are not infrequently found to be very decidedly in conflict with the health of the passengers, and no less dangerous to ports of arrival than were the passenger and traffic vessels of a past generation.

All sanitarians are more or less familiar with the conditions promotive of disease comprised within the tenement walls of brick vertically and longitudinally divided into compartments by hallways and partitions, pierced here and there with doors for ingress and egress, and provided with windows for light and some fresh air—by shaft or otherwise—from pavement to roof, though ever so much overcrowded. And in civilized communities everywhere the misery of people who, through poverty or other causes, occupy such unhealthful tenements, has never failed to excite public sympathy; insomuch, indeed, that in some communities, in Glasgow, for example, whole blocks of such tenements have been destroyed by national law* and healthful tenements substituted, with result of reducing the death-rate among those who occupied them from 70 to 24 per 1,000.

But not so by any means with regard to the iron tenements afloat, with their several submerged floors and apartments—a basement twenty feet below the water-level, with a filthy, stagnant sewer of bilge water beneath it, without a window for light or air nearer than thirty feet above the sewer, and no opening for egress or ingress except through the roof-deck, and this deck not infrequently converted into a pound for cattle. The intervening deck between the cattle pen and the steerage for emigrants is commonly divided into compartments for the mails and storage. The required air space in the steerage by law† is from 100 to 120 cubic feet per capita.

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* English Acts of Parliament, 1866–71.

† Acts of Congress, 1882 and 1887.

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Below the steerage is the hold for cargo, dark and airless, except by the ekeage of the foul gases into it from the bilge, which contributes more or less foulness to the cargo according to the tightness or otherwise of the ship's lining between and the nature of the cargo.

Surely it is no wonder that such tenements afloat, with no sanitary surveillance worthy of the name, should become the hatcheries of typhus fever and other infectious and communicable diseases. The Massilia, by which typhus fever was introduced into New York in January last, is an example. Five years ago, at the meeting of this Association in Chicago, I made a report on "Medical and Sanitary Service on Board Immigrant Passenger Vessels," containing a computation of the death-rate of 27,157 emigrants who took passage to New York during the month of April, 1887. Forty-one died on the voyage—an annual rate of over 55 per 1,000, giving ten days as the average duration of the time the passengers were on board ship. The mortality was not particularly excessive for that month, and it is not believed to be in excess of the present rate.

It is the misfortune of the New York quarantine that no record of the history of infected vessels has been kept; the health officers seem to have regarded their records as personal property, and have taken them away with them. Indeed, in their published official reports even the names of infected vessels are rarely given except incidentally. The report for 1891 is an exception—at least with regard to emigrant ships. But gleaning such records as I have been able to obtain, covering the last five years, there is no difficulty in designating some of the emigrant ships as rounders with regard to their liability to infectious diseases, indicating a continuous state of receptivity. The Alesia, which brought cholera to quarantine in 1887, is an example. She brought small-pox twice in 1888, twice in 1890, and she has recently arrived with measles. There are several other repeaters within the same period, of two or three times each. And Dr. William M. Smith, who has occupied the post for nearly twelve years—recently relieved—informs me, with regard to yellow-fever particularly, his recollection is that the disease was remarkably persistent year after year to certain vessels during the early years of his service. His report for 1889 contains this remarkable statement:

"The fact is worthy of special consideration, as illustrating the efficiency of the system adopted at this quarantine for an exclusion of yellow-fever, that in no instance has the disease occurred among the passengers or crew of vessels from ports known to be infected ports; the cases that have arrived were from localities where the disease was not known to exist, and on vessels that carried clean bills of health."

It would be difficult to adduce clearer evidence than this of the persistence of ship infection and its danger, even when not directly from infected ports.

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That such infected conditions of merchant vessels are no less common now than they were thirty years ago, it is only necessary to call attention to the outbreaks of yellow fever continually occurring on board vessels in frequent communication with Rio, Santos, Guayaquil, and other yellow fever ports, in commercial intercourse with the seaports of the United States.

What is said with regard to the persistence of the yellow-fever infection in such vessels also applies to other infections and the recurring outbreaks of infectious disease on board emigrant ships—*they are not disinfected.*

My opinion, with regard to efficient disinfection and the means of applying it, is sufficiently well known to require no repetition in this place. It will suffice to state that while *steam* is everywhere acknowledge to be the most efficient of all means, it is still, so far as I am informed, unused for the disinfection of vessels at our quarantine stations. At the New York establishment it has been used twice—first to the U. S. transport steamship *Delaware*, infected with yellow fever in 1862; and second, to the emigrant steamship *Britannia*, infected with cholera in 1887—in both instances in accordance with my advice, and with complete success.

Moreover, from all I have been able to learn of common practice in the premises, no attempt is made to apply such disinfectants as are used to the bilge—the breeding place of infective germs—and but rarely to the hold. The masters of infected emigrant ships have been *directed*, after permission to go to the wharves of the city and removing cargo, to disinfect the hold with sulphur or chlorine, and to wash with mercuric-bichloride solution; but I have not been able to find any one who has seen this done—even if it ever has been done. Is there any one who appreciates the by no means overwrought description I have attempted to give of a modern emigrant ship, who thinks that the dark and close recesses and crevices more or less common to all vessels, the special lurking places of disease germs, are ever penetrated by such means; or that the filthy paste composted by the motions of the ship, of the leakage at yellow fever ports and bilge water with which the limbers of vessels are plastered from the keelson to the deck are ever reached by the bichloride or any other solution, or by any fumes evolved in the hold, without exposing the limbers?

But I am gratified at being able to state that Dr. William T. Jenkins, the recently appointed health officer at the port of New York, promises the speedy application of steam to infected vessels, by which means, at a sufficient temperature to kill all disease germs without injury to the vessel, disinfection may be effectually accomplished.

While the recent laws of France and Germany against the importation of American pork obtained, no American ship laden with pork was cleared for those countries. Would it be a greater burden on France or Germany to prohibit the exportation of typhus or any other like dan-

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gerous disease thence to the United States than was the prohibition of pork from America? The solution of the question requires no argument, and it applies equally to all other countries.

The port health officers of the United States, and the health officer of the port of New York in particular, with regard to emigrant ships, are our sole reliance; they are assumed to possess ample power for the prevention of the introduction of epidemic diseases from abroad. But so long as emigrant ships are permitted to receive passengers and their luggage without restriction; vessels known to be infected with cholera, or to have merchandise suspected of cholera infection, refused entry at English ports, but given "clean" bills of health to proceed to American ports; merchant ships to receive any sort of merchandise at the tropical ports of South America and the West Indies where yellow fever obtains, and clear for American ports without credible bills of health—so long as any of these conditions obtain, and so long as there is no intelligent and reliable sanitary inspection at the *ports of departure*, and for *emigrant ships*, no competent sanitary supervision *during the voyage*, just so long will the people of the United States be subject to epidemics imported from abroad.

Every person acquainted with the construction of sea-going vessels, and with knowledge of the practices of those who command them, knows that it is often wholly impracticable, under the wilful deceptions that commonly obtain among the masters and medical officers of emigrant ships, and the clearance conditions of merchant vessels generally, for health officers to obtain reliable information with regard to infectious diseases at foreign ports; the sanitary condition of the vessels at the time of clearing; their previous condition—whether recently infected or not—or the nature of any disease that may have occurred during the voyage. Indeed, the present state of conducting commerce in epidemic diseases, by which they are so carefully concealed by those who set more value upon dollars than upon human life, is such that it is frequently altogether impracticable for the port health officer to discover their hiding places.

The only way of meeting and overcoming these dangerous conditions to the health of the people is by efficient *international* regulations, and a necessary prelude to these is a *national health service*—a service such as that contemplated by the bill of Senator Harris for a National Board of Health, introduced in the Senate, December 10, 1891.

As compared with other proposed national legislation with the same object in view:

It provides for a competent *personnel* in the organization of the board; the utilization of the consular service of the United States as means of information; the Naval and Marine Hospital services; co-operation with State and municipal authorities; voluntary public and private associations—in short, with all sources of information relating to climatic and other conditions affecting the public health. While it makes it unlaw-

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ful for any merchant ship or vessel from any foreign port to clear for any port of the United States except under clearly defined regulations for the protection of the public health, it respects the right and obligations of foreign nations to practice sanitation at the ports of departure, and—with regard to emigrant ships particularly—during the voyage. It provides against such cases as the one cited—the action of the health officer of Perth Amboy against the quarantine regulations of New York. It offers aid to all sanitary authorities in the United States, when required, to prevent the introduction of, and to seek out and destroy epidemic diseases and the conditions which promote them. There is no need of pursuing the excellent provisions of this bill in further detail. I prefer to take it for granted that every member of the section has made himself familiar with it.

One important deficiency, however, is apparent. While it provides for and exacts practical sanitation by the rightful authorities at ports of departure of foreign nations, it exacts none at our own ports; it leaves the clearance of vessels, emigrant or otherwise, proved to be infected—as was the *Massilia*—at the discretion of those who command them. A clean bill of health can be obtained from the port in such cases in the absence of prevailing epidemic disease in the city, yet the *ship* may be dangerously foul. To fill the bill, in this particular, the Government is already adequately equipped—it only needs detail. The United States Marine Hospital Service has, in default of international legislation (contemplated by Senator Harris's bill), done some excellent work through the courtesy of foreign nations—particularly at the port of Havana—to prevent the transmission of epidemic diseases hither. And, apparently, with the purpose of continued reliance upon the service of its medical officers in foreign ports, by courtesy, a bill is now before Congress to that end. But surely it must be well known to all persons conversant with the exclusive rights and practice of foreign nations, that such sanitary service is essentially unstable, ever liable to conflict with the sanitary authorities at ports of departure, and cannot be relied upon to prohibit the departure of an infected ship. The Marine Hospital Service is out of its sphere in this direction, while there is an open field for its labors in another, if the United States would set the example by practicing its own precepts—would see to it that the condition of every *vessel*, before she is permitted to receive cargo, is *clean* in a sanitary sense, and not at the mere voice of her master.

Surely it would be difficult to designate a more inviting field of labor—certainly none more germane to all that pertains to the health of mariners—than this for the Marine Hospital Service.

With such co-operation as this suggestion contemplates, under the auspices of a national board of health as provided for in Senator Harris's bill, and the international sanitary service which it would then be certain to secure, the transmission of epidemic diseases by commerce would speedily cease.

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PUBLIC BATHS AS A PREVENTIVE OF DISEASE.

By CHARLES H. SHEPARD, M. D., *Brooklyn, New York.*

A nation is powerful in proportion to the health of its people, and individuals are successful in life largely in proportion to their good health. Man begins existence with a certain stock of vitality, and his success or failure depends upon a careful use of that capital, so that good health, which should be his birthright, is of more importance than special fitness for lifework. The losses to the community from disease are beyond estimate, and yet they are so common as to blunt our realization of the conditions that surround us. What more desirable, therefore, than to seek some measure of relief? It is well to be able to cure disease, but a thousand-fold better to prevent it. Herein lies the physician's most noble field of work, that of preventive medicine.

Of all forms of prevention or cure, none appeal so directly to common sense as that of baths. None are more simple, and none more powerful when rightly directed. They are inexpensive and easily put into practice. They act upon the whole surface of the body, and, as a rule, are agreeable to all; for by quickening the action of the skin a more vigorous action of every internal organ and function is secured.

There are many kinds of baths, the swimming bath, the plunge, the shower, the douche, warm-water baths, medicated baths, mud baths, and the steam or Russian baths; lately the warm-water shower bath has deservedly won much favor, but for completeness of adaption to all classes and conditions of health and disease, no bath that ancient or modern science has yet devised is equal to the hot-air or, as it is more commonly called, the Turkish bath. It is a natural stimulus, and invigorates as nothing else can. It meets all the conditions, either local or general, where any bath is indicated, more fully than any other process. It has accomplished more as a remedy than any other one agency, and has never been known to injure when applied by competent hands. The action of heat, which constitutes the main feature of Turkish bath, increases the vigor of elimination, and gives full opportunity for the destruction of poisonous ptomaines which are quickly rendered inert or thrown out entirely. The secretions are made more active, and the excretions are increased in volume and efficiency. The increased circulation promotes the discharge of old or used-up tissue and the building up of new. The blood is at once a food stream and a sewage stream, for the living body is in solution in the blood, as is also the dead body that has done its work and needs to be eliminated. When it is seen that rheumatism or any other blood-disease which is acknowledged to be of microbic origin has been quickly relieved by the

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action of heat as applied in the Turkish bath, what more logical than to consider that this effect is produced through the destructive action of heat upon the microbes? Furthermore, by purifying and invigorating the circulation, it is reasonable to suppose that the normal germicidal activity of the serum of the blood and other fluids of the body is increased. This throws a hopeful light upon the future treatment of disease. No matter how certainly we may recognize disease or how quickly we may relieve the pains and penalties of an outraged nature, if we do not thereby learn to avoid the cause we are pursuing only an *ignis fatuus*, and the lesson of disease is lost.

The modern science of medicine made a great step forward when it came to the knowledge of the disease of the cells, otherwise called cellular pathology. Disease seems to be the result of blood-poisoning. Symptoms are but an effort of nature to dislodge this poison, or obtain freedom from it. It is an interesting thought of Dr. Carpenter that cancer is an excretory organ, formed to get rid of poisons in the system. The organic matter given off from the lungs alone, and which is a deadly poison, has been estimated at thirty or forty grains a day for each adult. It is recognized that a drowned man is only a poisoned man, because the waste that is continually going on in every part of the system is of such deadly character as to destroy life in a few moments. When the eliminative functions are in any way interfered with, in so far must the man be poisoned. This is due to the formation and absorption of poisonous substances, and while the specific germ is a cause of disease, the chemical factor is even more important. In the work of elimination, the depurative process through the skin is equally if not more important than that through the bowels and kidneys. Ordinary colds are best explained by the supposition that certain effete matters, which in health are normally excreted by the skin, are retained. This theory is borne out by the effects on the nervous system, and also by the fact that the only successful methods of treatment are essentially eliminative.

More fully to elucidate this subject let us refer to the ancient history of the Turkish bath, as well as the record it has made during the past thirty years or more. As far back as five hundred years before the Christian era, Hippocrates advocated the use of baths in general, and the sudorific bath inparticular, for the alleviation of disease. In warm climates the practice of plunging into cold water for the purposes of enjoyment and invigoration has been well nigh universal, but the establishment of thermæ, or hot-air baths, was looked upon in the first instance as medicinal, though subsequently they were resorted to as a luxury. Celsus prescribed these baths to his patients. Martial, in a celebrated epigram, recommended the dry heat of the laconicum and also baths in the cold water of Virgin and Martian, two streams in Southern Italy famed for their purity. Galen left on record directions

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for treating marasmus by the use of these baths. The early Christians, who led a severe and virtuous life, regarded public baths with horror. For many centuries baths and bathing were proscribed. Michelet speaks of the Middle Ages as "a thousand years without a bath." This long period was a time of terrible epidemics. Mysterious plagues, feeding, no doubt, upon the filth of the towns, swept away myriads of people.

Mæcenas, the friend of Augustus Cæsar and of Horace, is said to have been the first who introduced warm baths at Rome, though it is probable that warm bathing was a familiar practice throughout the east long previous to this period. The Hindoos and Mohammedans made cleanliness a part of their religion, and practised what it inculcated. India, Persia and Egypt were early acquainted with the bath. The primary construction was crude, but it was reserved for the Greeks, the greatest architects of ancient times, to erect suitable buildings for public baths. After the conquest of Greece, about 150 B. C., the Romans soon learned to imitate the example of their predecessors, and in the Augustan age, nearly coeval with the Christian era, Agrippa, the consul, erected an enormous and splendid bath, of which one small portion, the portico, now called the Pantheon, has descended to our times in a state of excellent preservation. More than a thousand other baths were destroyed by conflagrations and by barbarians, rather than by the hand of time. The ruins of these baths are among the most wonderful monuments of antiquity; several of them are conspicuous for their extraordinary magnitude and the magnificence of their decorations. To these baths, consecrated to health and recreation, the Roman citizens resorted as their chief enjoyment on holidays and festivals. The bath was the club-house, the café, and the restaurant, and here athletic games of all sorts were played, to give strength and vigor to the Roman people. The news of the day was sought for here, poems were recited, orators spoke from the rostrum, and minstrels sounded their harps. The price paid for the enjoyment of all this luxury was a quadrans, their smallest coin, much less than one cent, and the emperors would at times make the baths free, in order to popularize themselves with the people. In Turkey at the present day a large liberality is observed, every one paying according to his means; even the penniless cannot be legally excluded, if they be Mussulmans, as the bath is a religious institution among them, and every individual is required to attend it.

In ancient Rome, at the close of the third century after Christ, there were bathing facilities, including both public and private baths, for sixty-two thousand eight hundred citizens, at any one time. The earlier generations, those which made Rome the queen of the world, had always considered the bath the most important event and the most essential requirement in their every-day life, though in the course of time, and particularly after the conquest of the east, this was very much changed.

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The Romans established in the countries which they subjugated baths similar to those which they had established in their own, and they adopted a system of sanitary measures well worthy of admiration and adoption.

The occupation of Great Britain by the Romans during the first century of our era continued for more than three hundred years. Wherever their armies were located, which was in nearly every town, extensive thermæ were built, and among the many then erected there are now to be seen the ruins of more than twenty-five in different sections of England. The most notable of these are in the cities of Bath and Chester. Fine broad roads were built across the kingdom, and thus was kept a line of communication from one station to another. Many ruins indicate the existence of villas, where the generals and prefects resided. Attached to the villas were the ever-accompanying thermæ, both public and private. Wherever the Romans carried their victorious arms they established their laws, religion, and customs.

And where now is the bath? The Romans are gone! The Roman bath is apparently lost. Mr. Urquhart, the father of the modern bath, says, "A people which knows neither Greek nor Latin has preserved this great monument of antiquity on the soil of Europe, and presents to us, who teach our children only Latin and Greek, this institution in all its Roman grandeur and its Grecian taste. The ancient Roman bath lives in its modern offspring, the Turkish hammam." In our schools are taught the language, the literature, and the laws of the Romans, but one of their most important customs and sanitary measures, and one which very materially served to make them the all-powerful and great people that they were, that of the bath, has been entirely neglected. It was not till the personal experience of Mr. David Urquhart in the east led him to advocate its extension to the west that the modern movement began. In 1850 he published his book, "The Pillars of Hercules," in which he gave an account of the Turkish and Moorish baths. Six years afterwards he became acquainted with Dr. Richard Barter, proprietor of a hydropathic establishment at Blarney, in Ireland. At that place they together constructed the first Turkish bath of modern times.

Gibbon remarks, "Among the innumerable monuments of architecture constructed by the Romans, how many have escaped the notice of history, how few have escaped the ravages of time! The majestic ruins of thermæ, still scattered over all Italy and the provinces, would be sufficient to prove that those countries were once the seat of a powerful and a polite empire. Their greatness and their beauty deserve our attention; but they are rendered more interesting, inasmuch as they were erected at the public expense and intended for public utility."

The Augustan age was an epoch conspicuous for the development of sanitary measures for the promotion of public health; it was then that a public officer of high dignity was appointed over the management of

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the baths. In all the hot-air baths of the ancients, as well as in those discovered as having existed in the most primitive form in various parts of the world, however striking the difference may have been as regards construction, the same principle is observable throughout. All are directed to the one great end, that of *sweating*. In a remedial or therapeutical point of view, the hot-air bath claims an attention which is being slowly recognized by the medical profession and the public, and possesses medicinal and sanitary properties far beyond the ordinary bath of warm water. This is based upon its powers of altering the chemical and electrical conditions of the organic structures of the body, and abstracting its fluids. The work that it has accomplished since its introduction into this country, nearly thirty years ago, has proved beyond question that there is no more powerful agent for the prevention as well as cure of all filth diseases, fevers, diphtheria, scarlatina, and even small-pox, as well as the almost universal complaints of colds, catarrh, influenza, etc.

The remarkable success of the Turkish bath in the treatment of rheumatism and all blood diseases pre-eminently shows the advantage it would be to the community were large public baths of this kind established throughout the country. With a reform in the dietetic habits of the people and a frequent and an habitual use of the Turkish bath, there is good reason to believe that rheumatism and many other diseases would be far less prevalent. "We ask ourselves," says Erasmus Wilson, "not what disease will be benefited by the therma? but *what disease can resist its power?*" Every hospital, asylum, poor house, in fact all institutions, and especially those where people are massed together, should not be considered thoroughly equipped without a complete Turkish bath. Our people are now required to use disinfectants in many cases, but disinfectants come after disease has done its deadly work. Would it not be much more desirable, as a sanitary measure, to require the use of the bath as a preventive of disease, inasmuch as bathing in its most complete form is the best kind of disinfectant? We know that many epidemic and contagious diseases would be wiped out of existence by proper sanitary measures enforced in the localities where such have existed, but the culmination of all sanitary measures for the individual would be the Turkish bath. An incident, from a report published some thirty years ago, illustrates the value of the bath in the island of Cyprus, which contained a mixed population of Mohammedans and Christians. Among the former consumption was not known; among the latter, there was from twelve to thirteen per cent. of deaths from that disease. The great value of this bath has also been thoroughly demonstrated in the treatment of defectives and incorrigibles at the Elmira Reformatory, as appears from a report by the attending physician, Dr. H. D. Wey. We tax the industrious that we may punish those whom our neglect has made criminals and paupers; we multiply police and public house regu-

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lations, and expend large sums in hospitals; but we utterly deride the simple and comparatively inexpensive appliance of the bath. The conviction is irresistible that the reason of the universality of its use was because of its utility, that it possessed a healthful and curable potency, which commended it to the practical wisdom of mankind. American and European visitors to Japan speak with admiration of the public baths of that country, that are not only kept open in summer, but are warmed and open in the winter. In the city of Tokio there are between eight and nine hundred public bathing establishments, each frequented by at least three hundred people, who pay for the privilege an extremely small sum, so small that no one is too poor to afford it. Outside of these baths the Japanese are very much given to bathing in their own houses. They are one of the cleanliest people in the world. Travelers from the western world frequently express their regret, in describing these Japanese baths, that the progressive people of Europe and America have no such establishments.

John Wesley taught that "cleanliness is indeed next to godliness." People who are habitually clean are habitually temperate; cleanliness and temperance are twin virtues, and induce self-respect, industry, and order. The cost of building and maintaining public baths, which promote cleanliness, temperance, health, and morality, would be infinitely less than that of the poor houses, hospitals, jails, and the legal machinery required therewith. If the masses of our people were given an opportunity of making a selection between the tyranny and self-debasement engendered by the saloon, and the freedom, moral exaltation, and self-respect emanating from the bath, there is little doubt that we would soon have a new order of society.

There is no more doubt of the importance of cleanliness to the person than there is of cleanliness to the streets and houses, in conducing to the well-being, the comfort, and the health of the public at large, for if these are only attended to among the masses, there will be proportionally a less chance of the invasion of epidemics, which first begin with the less-favored portions of the community and finally sweep all before them. It has frequently been demonstrated that the epidemics which have visited our land had, for their breeding ground, if not for their origin, the most palpable violations of sanitary laws.

If no higher motive were to influence us, that of self-defense or prudence, possibly fear, might stimulate us to provide against evils so formidable, which are apparently so effectually and easily guarded against by a frequent use of the Turkish bath. As one of the great sanitary necessities of the day, it is most desirable that large public Turkish baths, as a preventive of disease, should be established throughout the land at public expense, placed under medical supervision, with admission at nominal rates, so that the poorest individual can partake of their advantages with a feeling of self-respect in paying something for the help

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and comfort to be derived therefrom. They should be made more attractive than the saloon, and thus prove a more powerful antidote than. any law of prohibition. This will react on the social life of the masses. By purifying the people we would quickly purify their homes. Here tofore this work has been left to private enterprise, but the time is fast approaching when it should be entertained on a larger scale than anything yet attempted. The public, who are to be the chief beneficiaries, should have the privilege of sharing the expense as well as the direction of such institutions.

The endowment of public baths was among the noblest actions of the Roman emperors. Eight hundred of those institutions adorned the capital of the empire, and they supplied, during many eventful years, almost the only medicine to a people distinguished for their corporeal and mental vigor.

If prevention be better than cure, then, to found a great public bath would confer a grander blessing than to erect a hospital. To provide an institution which should bring refreshment and vigor to the overworked, healing to the sufferer, warmth, comfort, and self-respect to the victim of squalor, poverty, and neglect, would be to raise a cenotaph more glorious

"Than ever from Attic or Etruscan hands arose."

THE SANITARY SIDE OF THE DRINK PROBLEM.

By T. D. CROTHERS, M. D., *of Hartford, Conn.*

Some conception of this problem may be obtained from the fact that in 1891 over eight hundred thousand persons were arrested in this country charged with being intoxicated and committing petty crimes.

It may be fairly presumed that at least half as many more, using spirits to excess did not come under legal notice. If to this is added opium, chloral, and other drug narcotics—the number reaches enormous proportions

Practically this vast army of inebriates represents all classes and conditions who are literally withdrawn from the ranks of active workers and producers, and become obstacles and burdens to sanitary life.

They are centers of pauperism and progressive degeneration and the most unsanitary physiological and psychological conditions.

This army literally follows a continuous line of retrogression which antagonizes all evolution, growth and development, and seems to be governed by a uniform law of cause and effect, marked by a beginning, development, decline and extinction, the mystery of which makes it the most absorbing scientific problem of the age.

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To-day over a million workers are waging a great moral crusade to break up this evil. Politics, religion, education, the pulpit and press are combined in a struggle with this problem, approaching it exclusively from the moral side. Mediæval superstitution and moral theories are urged through the pledge, prayer, persecution and punishment to explain and check this evil.

Above all this moral agitation and effort the voice of science appeals to physicians for help. This army of inebriates is increasing, and with it losses and degenerations both of individuals and the race. While inebriates are a part of the great army of the "unfit" that are "mustered out" and crowded out in the race march—there is yet unmistakable evidence that some can be halted, headed off, and returned to health.

Already science has pointed out the possibilities of cure and prevention, that give promise of practically stamping out this evil in the near future.

Some of the outline facts from the sanitary side will show its extent and the possibilities of cure from a larger and more accurate study of the subject. The great sanitary problem of to day is the knowledge and removal of the causes of disease, and the placing of the victim under the best conditions for a return to health.

To remove the conditions which favor and encourage disease, and break up the breeding places of crime, pauperism and allied forms of degeneration is one of the future certainties of science. There are to-day over a million unrecognized inebriates who are the most defective, dangerous, and degenerate of all classes.

They are centers of pauperism and sanitary evils that pass on into the next generation entailing misery and loss beyond estimate.

The superstition of personal freedom with free will, permits this army of inebriates to go on year after year, destroying themselves, increasing the burden of their families, and building up veritable centers of physical and mental degeneration.

Nothing can be more disastrous from a sanitary and scientific standpoint than the indifference which permits men and women to use alcohol and other drugs, not only destroying themselves but entailing all degrees of degenerations on their descendents.

Sanitary science teaches that no one has a right to destroy himself and peril the health and comforts of others. The moderate and periodic drinkers are always sources of danger to themselves and others. To wait until they become chronic and degenerate into law breakers is to apply the remedy when it is too late.

Public sentiment should not permit one to become an inebriate or tolerate him after he has reached such a stage. He should be prevented and forced to undergo treatment and should be regarded as dangerous to the safety and welfare of the community and isolated until fully restored.

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In the near future, science will demand that every inebriate have legal guardianship and restriction of personal freedom until he recovers. When these cases realize that such restrictions will be enforced, they will seek treatment in the early stages of their disease. The teaching of science demands that both the pauper and millionaire be seized at the very onset of and forced into conditions of health and sobriety, and saved from becoming burdens on the community, and centers of ruin and misery.

The saloon and the free sale of spirits from a sanitary point is a source of extreme danger. Its influence in any community is bad. It brings sanitary perils by destroying the physical and mental stability of its patrons and both directly and indirectly favors the worst conditions of life. The saloon has no claim for recognition as a business. It is simply a parasite thriving on the decay and degeneration of the community. It is only tolerated by the dense ignorance and selfishness of its defenders. It should be classed with foul sewers, dangerous waters and unsanitary death dealing forces, etc.

Persecution as a moral evil keeps it alive, but examination from the standpoint of science would be fatal to its perpetuity.

The drink problem would be largely solved could the favoring conditions of saloons be changed.

Unregulated marriage, now a mere matter of accident and impulse is another source of danger perpetuating the drink curse. Inebriates, insane, and neurotics of all degrees are permitted to propagate and transmit their defects to succeeding generations. The result is a race of neurotics that develop inebriety, and all forms of insanity and idiocy, together with all associated conditions.

The army of neurotics beyond all question reappears in succeeding generations with similar or interchangeable diseases. The inebriates of this generation who marry and raise up children are creating paupers, criminals and insane for the next. They are wrecking their descendents by crippling and incapacitating them to live healthy lives.

Every community illustrates this fact, and the drink problem is more complex and difficult of solution on this account.

We need scientific study and instruction on this point, and a public sentiment that will make marriage a question of sanitary science, then we shall have the means for practical prevention and cure of many present evils.

The drink problem has another sanitary side in defective nutrition—bad ventilation and other conditions of an unhealthy character.

Build up the physique, relieve the condition of starvation, remove the defects of unhealthy living and in many cases the tendency of the drink craze is thwarted.

Mental change, unrest and sudden change involving a strain on the organism to adapt itself to the new conditions for which it is unfit, also

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overwork, underwork and diseased conditions, defective and retarded growths, and nearly every kind and degree of mental and physical defect enter into the drink problem, and must be recognized and studied.

The present methods of dealing with this problem are followed by startling results.

Of the 800,000 persons who were arrested last year for inebriety not one per cent. were benefited. Over 99 per cent. were made worse, and confirmed in their habits. The station house and jail are active recruiting places, and the hosts of inebriates who are forced into them are transformed into legions of incurables which never desert or leave the ranks.

Physically the short imprisonment of the inebriate simply removes him from spirits and leaves him less capable of leading a temperate life.

Mentally he has lost a certain self respect and pride of character essential to recovery.

The first legal punishment of inebriates is followed by a species of fatality seen in a constant repetition of the same or allied offenses.

This fact is so apparent that these cases are called "repeaters" in the courts, and the number of sentences to the same person often extends to hundreds.

In one thousand cases confined at Blackwell's Island, New York, 935 had been sentenced for the same offense, drunkenness, from one to twenty eight times.

The first sentence was a regular switch-point from which the victim was precipitated to a constantly descending grade, becoming more and more incapacitated for temperate living.

The system of fines is equally ruinous, because it falls most heavily on the families, making it more difficult to support themselves, thereby increasing the perils of pauperism, both to the victim and those who depend on him for support.

It may be said, and the statement is sustained by many facts, that the legal treatment by the lower courts of cases of inebriety is fully as fatal as the saloons themselves where spirits are sold.

The saloon and police court are literally the school and college for the training and graduation of classes of incurable inebriates that peril every sanitary interest in the country.

The fault is not in the courts and their administration of the law, but in the laws themselves, and in that state of public opinion which urges that all inebriates should be treated as wilful criminals, and arrested and punished as such.

Thus, year after year this terrible farce of prevention of inebriety by fines and short imprisonments goes on and the incurability of the poor victims increases. Crime is increased, pauperism is increased, the most

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dangerous sanitary conditions are fostered, and the burdens of taxpayers and producers are increased.

The inebriate is always debilitated, and suffers from impaired brain and nerve force—alcohol has broken up all healthy action of the body.

In prison both the quality and quantity of food are ill adapted to restore or build up the weakened organism.

The hygienic influences of jails and prisons are defective in every respect, and adverse to any healthy growth of body or mind.

The psychological influences also are of the worst possible character. The surrounding and the associates precipitate the victim into conditions of mental despair from which recovery is difficult, if not impossible.

The only compensation to the inebriate is the removal of alcohol, and in this deprivation the State most terribly unfits him and makes him more and more helpless for the future.

Thus, while civilization is one of the sources from which inebriety is produced, the blundering effort to remove it by penal punishment is an actual factor in increasing and intensifying the disorder.

The treatment of inebriety from a scientific standpoint, has passed the stage of experiment and is supported by a great variety of experience and collateral evidence that cannot be disputed.

Probably the largest class of inebriates in this country are without means of support and may be termed the indigent and pauper class.

This class, non-supporting and burdensome, should come under legal recognition and be committed to workhouse hospitals, built for this purpose, preferably in the country, upon large farms and amid the most favorable environment.

These hospitals should be training schools in which medical care, occupation, physical and mental training could be applied for years, or until the inmates had so far recovered as to be able to become good citizens.

Such hospitals should support themselves in part from the labor of their inmates, having been built from monies received from a tax imposed on liquor dealers, or a license fund, and be independent of the tax payer or of State support.

These places would receive the classes who now are sent to jail, and that other class who are neglected until they have passed into the chronic stage and have become inmates of prisons and insane asylums.

A very large proportion of these several classes could be made self-supporting while under treatment, and in many cases be an actual source of revenue. The hospitals would naturally be divided into two classes. The first would receive the better, or less chronic cases; the second would have the incurables, and those whose recovery was deemed more or less doubtful. In one case the surroundings and discipline would be more adapted for the special inmates than in the other, but the same general restraint would be followed in each.

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In both recoveries would follow. A large class would be restored to society and become producers. In the second, cases would be housed and made to take care of themselves, which would be an immense gain to society in economy and safety.

Private enterprise should be encouraged by legislation to provide smaller hospitals for the better class and those who would be unwilling, or whom it would be undesirable to compel to enter public asylums. Here the commitments should be both forced and voluntary, and the restraint combined with the fullest and latest appliances of science for the end to be accomplished, blending seclusion and good surroundings to build up and make recovery possible.

The first step is to recognize the fact that the inebriate, whether continuous or periodic, has to a greater or less degree, forfeited his personal liberty, become a public nuisance and an obstacle to social progress and civilization. Second, that he is suffering from a disease which affects society and every member of the community in which he lives, and from which he cannot recover without aid from other sources, making it absolutely necessary that he should be forced into quarantine on the same principle as the small-pox or yellow fever patient. This is simply carrying out the primitive law of self-preservation. Naturally, the money to accomplish this shall come from the license revenue, on the principle that every business should provide for the accidents and injuries which follow from it. Railroad companies and other corporations are required to pay damages for the accidents which follow their business, and this is conceded to be justice. But to-day the tax on the liquor traffic is used to support courts and jails where the inebriate, by fines and imprisonment, is only made worse or more incurable. Thus, literally, the business of selling spirits is increased by the almost barbaric efforts of courts and jails, and every person so punished is made a permanent patron of that business. Against this all the teachings of science and all practical study utter loud protest.

The practical success of workhouse hospitals for inebriates is demonstrated in every self-supporting jail and State's prison in the country where the obstacles are greater and the possibilities of accomplishing this end more remote. This can also be seen in asylums for both insane and inebriates, in the various sanitaria and hospitals through the country where the capacity for self-support and the curability of these cases are established facts.

More than that, these hospitals would relieve society of great burdens, of loss and suffering, the diminution of the number of the inebriates indeed become a practical certainty, the extent of which we can have no conception of at present.

It is impossible at the present time to estimate the beneficial results that would follow a systematized plan of thus housing and treating the inebriate, but there are positive indications that its effect would be felt

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in all circles. One of the great fountain heads of insanity, criminality and pauperism would be closed, and a new era would dawn in the evolution of science.

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6. CONFERENCE OF THE STATE BOARDS OF HEALTH OF PENNSYLVANIA, OHIO AND WEST VIRGINIA.

PITTSBURG, *September 10, 1892.*

The Conference was held at the Hotel Anderson, present Dr. C. O. Probst, Secretary of the State Board of Health of Ohio; Dr. N. D. Baker, Secretary of the State Board of West Virginia; Dr. Benjamin Lee, Secretary of the State Board of Pennsylvania; Dr. J. H. McClelland, President of the State Board of Pennsylvania; Mayor Gourley, Chief Brown, Crosby Gray of the Department of Safety; Roger O'Mara, Dr. J. G. McCandless, Dr. W. E. Matthews, Dr. C. B. Dudley and Dr. J. R Thompson, Medical Inspectors of the State Board of Pennsylvania.

Mayor Gourley acted as Chairman and Dr. Dudley as Secretary.

Dr. Lee stated that two points were to be taken into consideration. First, the present sanitary condition of steamboats and railroads. The second, the careful inspection of railroad trains and steamboats at State lines in such a way as to protect the public health and prevent the introduction of cholera into the States, at the same time interfering as little as possible with travel. Similar conferences have already been held at Philadelphia and other places with the railway and local authorities. The best of feeling has been manifested.

The railroad authorities are ready to do anything required and the local authorities are everywhere being roused to action. At the Philadelphia conference last week the highest officials of the railroads and city were present and manifested a deep interest in the proceedings. The State Board of Health on September 3 took cognizance of the existing danger by meeting at Philadelphia and considering what steps should be taken to protect the interests in its charge.

He read notifications which were served on all the transportation companies, which are given below.

Dr. Probst said his State had already recognized the importance of precautions against cholera. Since September 9 inspections have been made of all immigrants from Canada, and much had been done in the way of preparation. Ten points in the State had been selected as inspection points for the railroads. At these places inspectors and nurses have been chosen. Arrangements had been made for the necessary buildings for hospitals, and for disinfection of persons and baggage.

Troops would be furnished as guards, etc. Measures are now being taken to protect that State along the lake front. The recent sanitary

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precautions taken in Canada are very encouraging and give hope that danger from the lakes will be warded off. Ohio of course relies much upon Pennsylvania, since probably most of the danger will come from this direction. However, Ohio is fully awake to the situation and will leave no means untried to keep the cholera out. Fortunately, through what is known as the emergency board, we have funds sufficient for immediate need, $10,000 having already been put at the disposal of the State Board and more, if needed, can be had.

Dr. Baker stated that since September 7 every train with immigrants had been stopped at the State border and inspected. Those with certificates of health from the port of entry are allowed to pass. All others are carefully inspected and furnished with clean bills of health before allowed to go on. He thought each State Board should require every immigrant to be furnished with a clean bill of health covering self and baggage, before allowing him to enter the State. The first State to receive immigrants could require it from the quarantine authorities, and this would insure a pass through all the States, unless something should develop in transit. Illinois has already adopted this rule. A clean bill of health from some recognized health authority is essential before the immigrant can enter the State.

Dr. Lee stated that Pennsylvania had not yet taken action similar to that taken by other States, because the State Board had absolutely no funds at its disposal for such work. The Governor has promised to furnish one hundred tents if needed, but he likewise has no funds at his disposal for emergencies like the present. Pennsylvania has very few local health authorities and a meagre organization, due to the same cause, lack of appropriate legislation. In case of an actual invasion by cholera the State Board has power to appoint inspectors and establish quarantine, but there will be no funds to establish hospitals, pay nurses or physicians or inspectors or to disinfect and prevent the spread of the disease.

Mayor Gourley recited the work accomplished through the efforts of the emergency council during the past two weeks, toward putting Pittsburg in good sanitary condition. He urged that provision must be made against having the disease brought to this city by railroads and steamboats. There are two questions pressing: First, what power of quarantine rests in the city of Pittsburg; where can it draw its quarantine line? Second, where is it wise to establish hospitals for cholera patients?

Dr. Lee replied that it would be impossible for the city to establish quarantine further away than the city line.

The second question aroused much discussion. It was agreed that it would be wise to establish a cholera ward in a separate building at the location of the present municipal hospital, but that would not be sufficient. There must be some place where persons attacked at a distant

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point of the city, or brought in by rail or boat could be taken. Full discussion brought nearly all in favor of a hospital on shore, with the additional precaution that the discharges from cholera patients under no circumstances, even though thoroughly disinfected be put into the sewers, but should be burnt in a crematory provided by the city for the purpose.

Crosby Gray arraigned the legislature for its criminal inactivity.

They should provide an emergency fund. This is not because the legislature has not been frequently and urgently asked. The State and local health Boards have many times called attention to this. The State Board should have sole charge of quarantine and the management of the matter. This would prevent conflict of the local authorities.

It was also agreed that the sewage from trains should not be distributed along the rails as is now the custom, but the railroad authorities will be asked to provide disinfected receptacles to receive it, to be emptied at the end of each division and the contents burned.

Chief Brown offered the following resolution, which was unanimously adopted, Secretary Lee being directed to transmit a copy of it to Governor Pattison:

At a conference of representatives of the State Boards of Health of Ohio, West Virginia and Pennsylvania and the executive officers of the city of Pittsburg, held at the Hotel Anderson, Pittsburg, September 11, 1892, the following resolutions were adopted:

Resolved, That his Excellency, the Governor of Pennsylvania, be and is hereby requested and earnestly urged to immediately place at the disposal of the State Board of Health the sum of not less than $50,000, as an emergency fund for use, if necessary, in preventing the introduction and spread of Asiatic cholera in said commonwealth, said fund to be obtained by temporary loan or otherwise.

Resolved, That the Mayors of Pittsburg and Allegheny be requested to join in an appeal to the Governor respectfully urging upon him a compliance with the foregoing resolution.

RULES FOR RAILROADS.

Dr. Lee in the course of his remarks read the following order, issued, by the State Board of Health at its meeting last week, and sent to all transportation companies in the State:

Notice is hereby given to the officers of all transportation companies whether by land or by water, that any transportation company shall be declared contraband of quarantine which shall introduce, land or transport within the borders of this Commonwealth of Pennsylvania any person suffering from Asiatic cholera or cholerine (so called), or any person who shall develop such disease within four full days after having

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been so introduced, transported or landed within the borders of said Commonwealth by such company.

If a railroad company be thus declared contraband of quarantine its trains shall be stopped at the State line and held until inspected by an inspector of this board and declared by him free from the danger of conveying the contagion of Asiatic cholera into this Commonwealth.

If a steamboat, canal or other navigation company, its boats shall not be allowed to enter any dock, tie up at any wharf or by any means land passengers, baggage or merchandise until it has undergone like inspection and been declared free from danger of introducing the said contagion into the Commonwealth of Pennsylvania.

The State Board of Health of the Commonwealth of Pennsylvania orders:

First. That all water closets and urinals in cars be provided with proper water-tight receptacles for retaining deposits instead of allowing them to fall on the tracks and thus endanger water supplies, said receptacles to contain disinfectants, and to be renewed at certain intervals in such places and in such manner as may be determined upon for the most perfect protection against infection. The adoption of the precaution should be begun with second-class and immigrant cars, and extended as rapidly as possible to first-class cars.

Second. Should the discharges of the sick fall upon seats, floors or platforms of cars or stations, they should first be disinfected and then removed in closed buckets and the soiled places then disinfected and thoroughly cleaned.

Third. All cars coming from infected places shall be disinfected before sweeping, and the sweepings disinfected and burned.

Fourth. All water closets and urinals in steamboats and canal boats shall be provided with proper water-tight receptacles for retaining deposits, instead of allowing them to fall into the water, which is in most instances the supply of drinking water for some center of population. Such receptacles shall always contain disinfectants and shall be emptied at the end of each trip in such manner and in such place as may be designated by the local authorities.

Fifth. All accumulation of filthy clothing and rags shall be at once disinfected and burned.

Sixth Should cholera become epidemic the drinking water furnished for the use of passengers should be boiled and, so far as possible, should not be obtained from places in which the disease exists. By order of the Board,

BENJAMIN LEE,
Secretary and Executive Officer.

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EVENING SESSION.

At the evening session the form of certificate of health which immigrants on railroads passing through Pennsylvania, Ohio or West Virginia will be compelled to carry was discussed.

Dr. N. D. Baker, of West Virginia, offered the following resolution which was adopted:

That the Secretary, Dr. Probst, be instructed to communicate with the Secretary of the Treasury, urging him to have each immigrant provided with a certificate of his inspection made by the Marine Hospital Service, such certificate to be recognized by the State Boards of Health represented at this conference.

The resolution, Dr. Baker said, was not meant to convey the idea that believed the National authorities in any manner lax in the requirements of the occasion, but the co-operation of the Government officials with the State authorities would be an assurance to the people that every precaution to prevent the cholera from coming here was being rigidly looked after. Dr. Probst was instructed to suggest to the Secretary of the Treasury the following information required, as being essential to the matter by the State Boards: The name and sex of the immigrant; the port of departure and entry; name of the vessel; duration of detention under observation after exposure to cholera; the destination and the name of the inspector.

Dr. Lee offered this resolution, which was adopted:

That the conference suggest to the several Boards here represented the expediency of adopting an order requiring every immigrant to be furnished with a certificate from the Bureau of Immigration or the United States Marine Hospital service at his or her point of debarkation, and forbidding steamboat or railroad companies to transport immigrants into or through their respective States not provided with such certificate. And further that whenever any Board shall consider it necessary to establish an inspection station at the State line, the inspector shall be provided with a punch by which such certificate can be countersigned if he deems the holder free from contagion.

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7. CONFERENCE WITH THE PHILADELPHIA BOARD OF TRADE.

October 17, 1892, Dr. Benjamin Lee, Secretary of the State Board of Health, and Mr. Howard Murphy, Chairman of the Committee on Water Supply, Sewerage etc., met the Committee on Water of the Board of Trade of the City of Philadelphia and Dr. Henry Leffmann, in conference at the rooms of the Board of Trade to discuss the question of protection of the various water supplies of the State, including the Scuyl-

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kill river. The following report was adopted by the Committee and forwarded to the Board of Trade:

REPORT OF THE COMMITTEE.

PHILADELPHIA, *October 17, 1892.*

To the President and Members of the Philadelphia Board of Trade.

GENTLEMEN: Your Committee on "Water" would respectfully report:

That it has duly considered the resolution in reference to granting police jurisdiction over the Schuylkill river which was presented at the last meeting of the board and referred to the committee.

A meeting of the Committee was held at which were present, by invitation: Benjamin Lee, M. D., Secretary, and Howard Murphy, C. E. Chairman of the Committee on Water Supply, Drainage, Sewerage, Topography and Mines, of the State Board of Health.

Mr. Howard Murphy stated that he is arranging on behalf of the State Board of Health, for a Conference, to be held in Reading, of all the health and water works authorities of the drainage area of the Schuylkill River, together with Boards of Trade, railroad officials and other persons, the primary object being to secure joint effort to protect the water supplies within said drainage area from pollution as well as to encourage similar action in other parts of the State.

Your Committee submits for your consideration, with recommendation for their adoption, the following preamble and resolutions:

Whereas, The epidemic of cholera which has reached the borders of the United States, demands the most energetic and vigorous action at the hands of the proper authorities to prevent its entering Pennsylvania and other States, therefor be it

Resolved, That the Philadelphia Board of Trade memorialize the Legislature of Pennsylvania to grant to the State Board of Health, police jurisdiction over all the drainage areas of Pennsylvania from which water supplies are taken.

Resolved, That the municipal authorities and Trade organizations of Philadelphia and other cities and towns bordering on the Schuylkill river, which take their water supplies from that river and its tributaries, be requested to act with the Philadelphia Board of Trade in obtaining the needed legislation in this vital and important matter.

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APPENDIX E

COMPLAINTS AND ORDERS FOR ABATEMENT OF NUISANCES.

Complaints on which action was taken during the year:

1. Small-pox at Point Pleasant, Bucks county.
2. Small-pox at Morrisville, Bucks county.
3. Piggery at West Laurel Hill, Montgomery county.
4. Sewerage and drainage of Pottstown, Montgomery county.
5. Refuse from cider mill at Chambersburg, Franklin county.
6. Scarlet fever at Ardmore, Montgomery county.
7. Diphtheria at Locust Gap, Northumberland county.
8. Diphtheria at Erie, Erie county.
9. Cerebro spinal meningitis at Phillipsburg, Centre county.
10. Pollution of water supply at Harrisburg, Dauphin county.
11. Typhoid fever at Nanticoke, Luzerne county.
12. Diphtheria at Springfield, Delaware county.
13. Diphtheria at Horton City Indiana county.
14. Cesspool at Ardmore, Montgomery county.
15. Scarlet fever at Eldred, McKean county.
16. Small-pox in Philadelphia.
17. Scarlet fever in Stewartstown, York county.
18. Diphtheria at Ogontz, Montgomery county.
19. Filthy tenement at same place.
20. Diphtheria at Latrobe, Westmoreland county.
21. Pollution of water supply at Scranton, Lackawanna county.
22. Drainage at Lansdowne, Delaware county.
23. Small-pox at Titusville, Crawford county.
24. Diphtheria at Greensburg, Westmoreland county.
25. Small-pox at Clarke's Valley, Schuylkill county.
26. Invasion of Huns at Bridgeport, Montgomery county.
27. Piggery at Chestnut Hill, Montgomery county.
28. Diphtheria at Ogontz, Montgomery county.
29. Pollution of canal basin at Muncy, Lycoming county.
30. Small-pox at Pittsburg, Allegheny county.
31. Typhoid fever at New Hope, Bucks county.
32. Typhoid fever at Military Academy, Chester, Delaware county.
33. Typhoid fever at Homewood, Allegheny county.
34. Typhoid fever at South Fork, Cambria county.
35. Floods at Titusville, Oil City and Meadville.
36. Small-pox at Coudersport, Potter county.
37. Small-pox at Mill Creek, Luzerne county.
38. Small-pox at Garland, Warren county.
39. Diphtheria at Seven Valley, York county.
40. Slaughter house at Greensburg, Westmoreland county.

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41. Stagnant ponds at Morrisville, Bucks county.
42. Insanitary conditions at Wayne, Delaware county.
43. Minor nuisances at Greensburg, etc., Westmoreland county.
44. Impure water at Birdsboro, Berks county.
45. Small-pox at Bunola, Allegheny county.
46. Diphtheria at Kirkwood, Lancaster county.
47. Diphtheria at Chadd's Ford, Delaware county.
48. Small-pox at Pittsburg, Allegheny county.
49. Dysentery at Lunatic Hospital, Norristown, Montgomery county.
50. Slaughter house at Muncy, Lycoming county.
51. Complaint of local board, Norristown, Montgomery county.
52. Diphtheria at Trainer, Delaware county.
53. Pollution of water supply at Allegheny City, Allegheny county.
54. Drainage of Johnstown, Elk county.
55. Small-pox at Newcastle, Lawrence county.
56. Small-pox at McKeesport, Allegheny county.
57. Italian settlement at Wayne, Delaware county.
58. Slaughter house at Morrellville, Cambria county.
59. Condition of line of Wilkes-Barre and Eastern railroad.
60. Water supply of Royersford, Montgomery county.
61. Location of Contagion Hospital at Bryn Mawr College.
62. Slaughter house near Bolivar, Westmoreland county.
63. Altoona reservoirs, Blair county.
64. Small-pox at Allentown, Lehigh county.
65. Dumping of garbage near Pittsburg, Allegheny county.
66. Drainage into abandoned coal mines.
67. Carnegie's Steel Works, Allegheny county.
68. Slaughter house, Knoxville, Tioga county.
69. Drainage, Irvona, Clearfield county.
70. Slaughter house, West Grove, Chester county.
71. Hog-pen, Fallsington, Bucks county.
72. Slaughter house, Falls Creek, Jefferson county.
73. Tannery drainage, Millerstown, Perry county.
74. Pollution of stream, Huntingdon, Huntingdon county.
75. Sewer, Punxsutawney, Jefferson county.
76. Pollution of creek, South Bethlehem, Northampton county.
77. Slaughter house, Cresson, Cambria county.
78. Slaughter house, New Salem, Fayette county.
79. Impure water, Bridgeton, Montgomery county.
80. Pollution of stream, Leechburg, Armstrong county.
81. Slaughter house, Catasauqua, Lehigh county.
82. Drainage, Suterville, Westmoreland county.
83. Slaughter house, Apollo, Armstrong county.
84. Cesspools, Narbeth, Montgomery county.
85. Insanitary conditions, Wallingford, Delaware county.
86. Insanitary conditions, Clearfield, Clearfield county.
87. Pig-pen, Wayne.
88. Insanitary conditions, Spring Forge, York county.
89. Pollution of river, Steelton, Dauphin county.
90. Creamery, Hopbottom, Susquehanna county.
91. Slaughter house, Perkiomen Junction, Montgomery county.
92. Pig-pen, Pottstown, Montgomery county.
93. Pollution of stream, Mill City, Wyoming county.
94. Slaughter house, Millevale, Allegheny county.
95. Drainage, Susquehanna, Susquehanna county.
96. Impure water, Washington, Washington county.
97. Open sewer, Braddock, Allegheny county.

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98. Insanitary conditions, Radnor, Delaware county.
99. Pollution of stream, Scranton, Lackawanna county.
100. Typhoid fever, Normal School, Slippery Rock, Butler county.
101. Dead horse in creek, Flushing, Bucks county.
102. Drainage, Tyrone, Blair county.
103. Insanitary conditions, Freeland, Luzerne county.

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1. Small-pox was reported at Point Pleasant, Bucks county. Inspector Atkinson visited the place, placarded the infected house, called a meeting of the citizens, with the assistance of Dr. A. M. Cooper, appointed sanitary, quarantine and finance committees, established day and night watches. Dr. Cooper was appointed deputy inspector. Vaccination was ordered, and the disease spread no further.

2. Small-pox at Morrisville, Bucks county. Inspection was made by Inspector Atkinson, who found the house placarded and quarantined, and vaccination being performed. No other cases occurred.

3. Piggery at West Laurel Hill, Montgomery county. Being just outside the limits of Philadelphia, the City Board charged the garbage collector and street commissioner to see to it and the nuisance was abated.

4 Sewerage and drainage of Pottstown, Montgomery county. Investigated by Inspector Atkinson, who reported a lamentable state of the borough, owing to the borough having reached its debt limit.

5. Refuse from cider mill at Chambersburg, Franklin county. Dr. Groff, to whom the matter was referred for information, agreed that disease germs were not likely to live in such matter. The proprietor agreed to use quick lime freely and remove the mass when cool weather would allow.

6. Scarlet fever at Ardmore, Montgomery county. Inspector Atkinson placarded the house, left circulars, and the attention of the clergy was called to the danger of public funerals.

7. Diphtheria at Locust Gap, Northumberland county. Dr. B. F. Bartho was appointed deputy inspector, who reported the organization of a Board of Health who were vigorously cleaning the place, draining, abolishing public funerals, quarantining and disinfecting. Result, the speedy diminution of cases.

8. Diphtheria at Erie. Request from Inspector Woods for power to close schools, diphtheria epidemic. Power was telegraphed by the Secretary. A conference with the school directors was advised. As a result of Dr. Woods' energetic action, the epidemic rapidly declined.

9. Cerebro spinal Meningitis at Phillipsburg, Centre county. Inspector Dudley was unable to discover any cause. The Secretary addressed a note to Professor L. A. Sayre, of New York, who had investigated this subject several years ago, he replied that the conditions leading to the disease were almost entire absence of ventilation, the use of kerosene

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lamps, allowed to burn low during the night, and low and innutritious diet.

10. Pollution of water supply at Harrisburg. Complaint from the Mayor. Referred to Mr. H. Murphy, who visited Harrisburg, conferred with the authorities, and the water department, and suggested that the water be drawn from a point further from the shore.

11. Typhoid fever from milk supply at Nanticoke, Luzerne county. Inspector Taylor after an investigation had concluded the milk to be the cause.

12. Diphtheria at Springfield, Delaware county. Deputy inspectors were appointed in order to insure the enforcement of proper precautions.

13. Diphtheria at Horton City, Indiana county. Inspector Free had reported that no need existed for interference by the Board.

14. Cess-pool nuisance at Ardmore, Montgomery county. Not proper number of signatures to complaint.

15. Scarlet fever at Eldred, McKean county. No action.

16. Small-pox in Philadelphia. Cases had been guarded by the city and the infection stamped out.

17. Scarlet fever in public school at Stewartstown, York county. A parent had insisted on another child from the infected house attending school. The Secretary replied that the school board had entire authority.

18. Diphtheria at Ogontz, Montgomery county. The Secretary had ordered the vacation of the infected house, its disinfection, and appointed a deputy inspector to enforce the orders.

19. Filthy tenement at the same place. Reported by Dr. Cooper as unfit for use from age and filth, the turnpike company ordered to remove it.

20. Diphtheria from untrapped sewer at Latrobe, Westmoreland county. Secretary advised the afflicted family to prosecute those who had so outraged sanitary law.

21. Pollution of water supply at Scranton, Lackawanna county. Blank forwarded, but no reply as yet.

22. Defective drainage at Lansdowne, Delaware county. Inspector Atkinson reported the whole place greatly needing drainage facilities.

23. Small-pox at Titusville, Crawford county. Traced to infected baggage of immigrant. Local board had prevented the spread of the disease. This suggested need of proper disinfection at quarantine. Secretary was directed to communicate with the health officer of New York and insist upon the disinfection of all baggage from steamers with such diseases on board.

24 Diphtheria at Greensburg, Westmoreland county. Investigation failed to sustain the complaint.

25. Small-pox at Clarke's Valley, Schuylkill county. Inspector Weidman had been ordered to investigate.

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26. Invasion of Huns at Bridgeport, Montgomery county. A large number of Italians were occupying a house which was in a filthy condition. The Secretary replied that the burgess had ample power.

27. Piggery at Chestnut Hill, Montgomery county. Blanks sent.

28. Diphtheria at Ogontz, Montgomery county. Inspector Atkinson sustained the complaint, and condemned the building as unfit for habitation, urging its removal. Also a swamp needing draining. The deputy reported these remedied.

29. Pollution of canal basin at Muncy, Lycoming county. Blank sent.

30. Small-pox at Pittsburg, Allegheny county. Cases isolated, premises disinfected, vaccination performed.

31. Typhoid fever at New Hope, Bucks county. Inspector Atkinson reported the disease stopped after the entire family had been attacked. Disease due to well contaminated by filthy drainage. The well was cleaned.

32. Typhoid fever at Chester Military Academy. Inspector Atkinson in company with Surgeon J. S. Billings, U. S. A., had investigated the matter, and reported no local cause. The disease undoubtedly had been acquired outside the institution.

33. Typhoid fever at Homewood, Allegheny county. Investigation showed the matter to have been greatly exaggerated.

34. Typhoid fever at South Fork, Cambria county. Inspection has been made by Inspector Matthews, the water examined and its use discontinued.

35. Floods at Titusville, Oil City and Meadville. Telegrams were sent to the Governor and to the mayors of the cities, an inspection was ordered, but replies showed all able to cope with the emergency.

36. Small-pox at Coudersport, Potter county. Owing to illness of the inspector of the district, absence or engagements of others, difficulty was experienced in obtaining an inspection. Inspector Thompson finally reported the origin to have been from a Polish family, one case had proved fatal from which six others had developed. Isolation, disinfection, etc., had stamped out the disease.

37. Small-pox at Mill Creek, Luzerne county. Quarantined in a pest house erected for the occasion.

38. Variola at Garland, Warren county. Reported by Inspector Woods, but no further information received.

39. Diphtheria at Seven Valley, York county. Circulars and advice sent.

40. Slaughter house at Greensburg, Westmoreland county. Secretary urged the prosecution of the owner, and he then promised to comply with the orders of the Board.

41. Stagnant ponds at Morrisville, Bucks county. This being a private nuisance, the corporation was advised not to interfere.

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42. Insanitary conditions at Wayne, Delaware county. One of the contractors was anxious to do all that was needed. Others had not replied.

43. Complaints of minor nuisances had been received from Greensburg, and a number of other places, but no reply had been received to the forms which had been sent.

44. Impure water at Birdsboro, Berks county. Engineer Inspector Boardman reported the nuisance as caused by a large number of old stumps and debris at the bottom of the reservoir, by the building of a brick wall laid in cement mortar across the spillway (which forced the water out of its original limits back into the woods) and the absence of a fence around the reservoir to prevent the contamination by cattle. He recommended these to be remedied, which recommendations were forwarded to the local authorities.

45. Small-pox at Bunola, Allegheny county. Inspector Thompson reported one case of confluent small-pox. All the usual plans had been carried out, but three other cases had developed. Later, gross carelessness had been shown by the county poor directors, in allowing infected clothing to be used. The Secretary had energetically remonstrated.

46. Diphtheria at Kirkwood, Lancaster county. A stringent order had been prepared by the Secretary and sent to Dr. T. J. Wentz for distribution.

47. Diphtheria at Chadds Ford, Delaware county. Inspector Atkinson reported it due to a house with a defective drain. The hotel drainage also infected the water. Orders were sent for the abatement of these nuisances, and a deputy was appointed.

48. Small-pox at Pittsburg. Two cases had occurred, later four more The usual precautions were taken.

49. Dysentery at Norristown Lunatic Hospital. Inspector Atkinson reported the disease abating, the hospital in good condition. The prevalence being no doubt a continuance in a mild form of that of last year.

50. Slaughter house at Muncy, Lycoming county. Inspection by Dr. Groff failed to show any serious cause of complaint.

51. Complaint of local board of Norristown. Inspector Atkinson reported verification of the complaints, and the proper action for their removal was taken.

52. Diphtheria at Trainer, Delaware county. Inspector Atkinson had found several nuisances, and notice served for abatement.

53. Pollution of water supply of Allegheny City. The Secretary had inspected, found dangerous pollution by sewage, etc., and urged immediate action by the mayor of the city.

54. Drainage of Johnstown, Elk county. Inspector Free reported the nuisance caused by a railroad company refusing to allow the sewer of a hotel, the buildings of a real estate company and of a manufacturing

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company to pass under their tracks. The Secretary urged the borough to construct the sewer.

55. Small-pox at New Castle, Lawrence county. Inspector Thompson reported an original mistaken diagnosis of chicken-pox had produced fifteen cases, but the disease had been brought under control.

56. Small-pox at McKeesport, Allegheny county. Inspector Thompson reported that the proper precautions had been taken.

57. Insanitary condition of Italian settlement at Wayne, Delaware county. Inspector Atkinson reported much filth, crowding, etc. The deputy was instructed to keep a close watch on this place.

58. Slaughter house at Morrellville, Cambria county. Inspector Matthews confirmed the complaint and an order was issued to the owners to abate the nuisance.

59. Insanitary conditions on line of the Wilkes-Barre and Eastern railroad. Inspectors McIntire and Taylor had been in correspondence with the company and the contractors were notified by the Secretary to observe sanitary precautions.

60. Water supply of Royersford. Not polluted, no action needed.

61. Complaint as to location of hospital for contagious diseases at Bryn Mawr. Inspector Atkinson reported that at present no danger existed.

62. Slaughter house near Bolivar, Westmoreland county. Inspector Matthews reported it a nuisance and the Secretary ordered it abated.

63. Altoona reservoirs. Inspector Dudley urged that while these were being cleaned, the filth must not be so placed as to find its way into water again. The Secretary notified the authorities of the great danger in this way with the prospect of cholera in the land.

64. Small-pox at Allentown, Lehigh county. Infection had been brought from New York. The usual precautions were ordered.

65. Dumping of garbage into the Ohio river near Pittsburg. The Secretary condemned this action and urged a better disposal.

66. Drainage into abandoned coal mines. The Board passed resolutions condemning this action.

67. Carnegie's steel works. Inspection by the Secretary and Dr. McClelland showed the charge of insanitation to be unfounded.

68. Slaughter house, Knoxville, Tioga county.

69. Defective drainage, Irvona, Clearfield county.

70. Slaughter house, West Grove, Chester county.

71. Hog-pen, Fallsington, Bucks county.

72. Slaughter house, Falls Creek, Jefferson county.

73. Tannery drainage, Millerstown, Perry county.

74. Pollution of stream, Huntingdon, Huntingdon county.

75. Pollution of creek, South Bethlehem, Northampton county.

76. Filthy sewer, Punxsutawney, Jefferson county.

77. Slaughter house, Cresson, Cambria county.

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78. Slaughter house, New Salem, Fayette county.
79. Impure water, Bridgeton, Montgomery county.
80. Pollution of stream, Leechburg, Armstrong county.
81. Slaughter house, Catasauqua, Lehigh county.
82. Drainage, Suterville, Westmoreland county.
83. Slaughter house, Apollo, Armstrong county.
84. Cesspools, Narbeth, Montgomery county.
85. Insanitary conditions, Wallingford, Delaware county.
86. Insanitary conditions, Clearfield, Clearfield county.
87. Pig-pen, Wayne, Erie county.
88. Insanitary conditions, Spring Forge, York county.
89. Pollution of river, Steelton, Dauphin county.
90. Creamery nuisance, Hopbottom, Susquehanna county.
91. Slaughter house, Perkiomen Junction, Montgomery county.
92. Pig-pen, Pottstown, Montgomery county.
93. Pollution of stream, Mill City, Wyoming county.
94. Slaughter house, Millevale, Allegheny county.
95. Drainage, Susquehanna, Susquehanna county.
96. Impure water, Washington, Washington county.
97. Open sewer, Braddock, Allegheny county.
98. Insanitary conditions, Radnor, Delaware county.
99. Pollution of stream, Scranton, Lackawanna county.
100. Typhoid fever at Normal school, Slippery Rock, Butler county.
101. Dead horse in creek, Flushing, Bucks county.
102. Drainage, Tyrone, Blair county.
103. Insanitary conditions, Freeland, Luzerne county, were all acted on by correspondence after investigation.

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APPENDIX F.

CIRCULARS AND FORMS.

1. Form 24. Annual Reports of Boards of Health.
2. Form 25. Reports of Medical Inspectors.
3. Circular No. 20. German Edition, revised.
4. Circular No. 22. German Edition, revised.
5. Circular No. 34. Treatment of the Apparently Drowned.
6. Circular No. 35. Prevention of Blindness.
7. Circular No. 36. Sanitary Protective Associations.
8. Circular No. 7. Revised Precautions against Cholera.
9. Circular Letter to Boards of Health and Municipal Authorities.
10. Circular on School Hygiene, revised

1. FORM 24. ANNUAL REPORTS OF BOARDS OF HEALTH.

Annual report of the health officer or secretary of the board or bureau of health of the . . . . . of . . . . . made to the State Board of Health of Pennsylvania, for the year beginning January 1, 189 , and ending December 31, 189 .

☞ (Include nothing outside of these dates.)

☞ The annual report of the local board of health should be made as early in January as possible.—Write in the blank space after each question, or, if more room is needed, write on the accompanying blank sheet placing the appropriate figure before each answer.

1. Give the name and address of each member of your board.

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NAME.	Postoffice Address.
. . . . . , Secretary.	. . . . .
. . . . . , Chairman.	. . . . .
. . . . . , Member.	. . . . .
. . . . . , "	. . . . .
. . . . . , "	. . . . .
. . . . . , Health officer.	. . . . .

2. How many meetings have been held by the board during the year?

3. Have any improvements or changes been made in your . . . . . as regards water supply, drainage and sewerage, or in the methods employed in disposing of excreta? If so what, briefly?

4. Nuisances. How many have been reported to your board? How many have been removed? Please report the facts in regard to any nuisances of unusual character, or which have given unusual trouble in respect to decisions regarding them, or in which there has been unusual difficulty in securing abatement.

5. Communicable diseases. Please give the facts called for in the following table:

NAME OF DISEASE.	No. of cases.	No. of deaths.	No. of outbreaks.	No. of houses infected.	No. of outbreaks confined to the first house.
Small-pox, ...	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Diphtheria, ...	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Scarlet fever, ...	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Typhoid fever, ...	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

6. Are these diseases reported to your Board by the physicians in attendance in accordance with the law ordinance or regulation requiring such reports?

7. What action has been taken by your board when cases of the communicable diseases have been reported to it?

8. Were houses in which cases of small-pox, diphtheria and scarlet fever occurred placarded?

9. What diseases were more than usually prevalent during the year? (Measles, scarlet fever, small-pox, whooping-cough, German measles, pneumonia, cerebro-spinal meningitis, diarrhœal diseases of children, etc.) Erase those not prevalent.

10. Please communicate the facts regarding any cases of disease which were interesting from a sanitary point of view. (Unusual course of epidemic prevalence, unusual symptoms or want of certain symptoms, observations as regards period of incubation, communication of diseases by contagion, spread of contagious diseases by public funerals, long

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periods of vitality of infection, concurrent or consecutive prevalence of diseases, etc.)

11. Schools. Have any special cases come under your observation in which unhealthy conditions existed? Have contagious diseases entered any of the schools? If so, what action was taken?

12. Are there in your . . . . . any particularly unhealthy localities? If so, what appears to be the cause of such unhealthfulness?

13. What methods can you suggest for improving the sanitary condition of your . . . . . ?

14. Accidents. Has sickness or death resulted from accidental causes; drowning, fires, and kerosene accidents? If accidents have occurred from the last cause, please report in full to this Board.

15. Please communicate the facts regarding any cases of disease which appeared to have been caused by polluted water, cess-pool or sewer-gas, defective ventilation, lead, arsenical, or other forms of poisoning.

16. Have any instances of food adulteration, or injurious effects from it, come to your knowledge?

17. Diseases of animals. Please report any cases of diseases of animals which have occurred, and any cases of relation or apparent relation between such diseases and human diseases.

18. Were any by-laws adopted by your board in 189 ? If so please forward copies of all such to the office of the State Board.

19. Please give an account of any other work of interest which has been done by your board during the year.

20. Has the experience of your board suggested any changes which ought to be made in the health laws of the State? If so, please report them.

21. What compensation or pay has been received by the secretary or health officer of your board, or by other members? If payment has not been received, for what reason?

Signed, ...

. . . . . , 189 . . . . . .

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2. FORM 25. REPORTS OF MEDICAL INSPECTORS.

COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
. . . . . DISTRICT.

Report of inspection at . . . . . by . . . . . Medical Inspector, on account of . . . . . 189 .

To the Secretary of the State Board of Health:

SIR: I have the honor to report that in compliance with instructions received from you . . . . . 189 , I visited . . . . . on . . . . . and found the following conditions to exist:

NOTE.—Inspectors are requested to follow as nearly as possible the following order: Population. Whether incorporated. Name of health officer or chief burgess. Location and Geological formation. Drainage. Water supply. Prevalent diseases. Present epidemic, if any. Verification of diagnosis. Number of cases. Duration of epidemic. Type of disease. Precautions already taken. Precautions suggested. Inspectors will issue orders only when especially so instructed.

3. CIRCULAR NO. 35. PREVENTION OF BLINDNESS.

The preparation of this circular is the result of representations made to the State Board of Health by two prominent medical societies of the city of Philadelphia at different times, and each without the knowledge of the action of the other. Their belief upon which it is based, may therefore be said to present the deliberate opinion and judgment of the medical profession at the present day. The facts presented are drawn from the communications above referred to, but they may be found abundantly in the current medical literature of the past ten years. It is not necessary to enter into an argument to show that every case of blindness is a money-loss to the State, or that, consequently, every case of blindness prevented will be a money-gain to the State. The following facts therefore have a significance to the political economist quite apart from their bearing upon a most important factor in the world's total of suffering and privation.

First. There is in the State of Pennsylvania, as in the United States, an apparently rapid increase in the number of the blind.

Second. A large percentage of blindness is due to the disease known as purulent ophthalmia of the new born.

Third. By the use of known methods this could be very materially lessened.

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RAPID INCREASE OF BLINDNESS IN PENNYSLVANIA.

When we compare the report of the United States census of 1870 with that of 1880 we find that the increase of population for Pennsylvania for that period was 21.6 per cent., while the apparent increase in blindness for the same period was 119.8 per cent., showing that blindness increased over five times more rapidly than the population. In New York the figures are even more startling.

A SINGLE DISEASE, OPHTHALMIA OF NEW BORN INFANTS, THE MOST PRODUCTIVE CAUSE OF BLINDNESS.

In the second place, the most important factor in the production of blindness is the purulent ophthalmia of infants, or ophthalmia neonatorum. Fuchs found that among 3,204 cases of blindness collected from asylums in different parts of Europe 23.5 per cent. were due to ophthalmia neonatorum. In the New York Institution for the Blind, at Batavia, 23.4 per cent. of the inmates are there as the result of the same disease.

Horner has shown that among 100 blind asylums in different countries the variation was from 20 to 79 per cent.—average 33 per cent.

Haussmann gives the number in the asylum in Copenhagen made blind by this disease 8 per cent., in Berlin 20 per cent., in Vienna 30 per cent., in Paris 45 per cent.

According to the report of the Royal Commission on the blind, of the English government, published in 1889, 30 per cent. of the inmates of the institutions, and 7,000 persons in the United Kingdom have lost their sight from this cause. Professor Mangus of Breslau, finds that no less than 72 per cent. of all who become blind during the first year of life are rendered so by the purulent ophthalmia; and even of those who become blind before the twentieth year of life, it constitutes as much as 23.50 per cent. Looking at the subject in another way he shows that of 10,000 children under five years of age, 4.28 are blinded by purulent ophthalmia. In the blind asylums of Switzerland the proportion who have lost their sight from this disease is 26 per cent.; in the asylums of Hungary and Italy about 20 per cent. while in Spain and Belgium it falls to about 11 or 12 per cent. An investigation into the causes of the blindness of 167 inmates of the Pennsylvania Institution for the Blind, made by Dr. George C. Harlan, of Philadelphia, developed the fact that 55 owed their affliction to purulent ophthalmia, and that more than half of these cases occurred in infancy.

OPHTHALMIA OF THE NEWBORN IS AN INFECTIOUS AND THEREFORE A PREVENTABLE DISEASE.

Whenever the fact is demonstrated that a disease is infectious, contagious, communicable from person to person, either by direct contact or through the medium of infected articles it becomes the duty of the physician and the sanitarian to discover, if possible, the source and character of this infectious matter, and to provide means for preventing its transmission.

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Ophthalmia of the newborn is an infectious disease, and can only occur after the infectious matter has come into actual and somewhat prolonged contact with the conjunctiva. The noxious matter is in every instance derived from an inflamed vagina (or urethra), or from another eye. In the great majority of cases infection takes place from the vagina, and it is to be remembered that the disease is not caused by the secretion of the specific (gonorrhœal) catarrh only, but that it may be produced by the secretion of a simple leucorrhœa, or at least by what is recognized as such clinically.

As regards the period when infection occurs, this may take place either during or immediately after birth, or at some subsequent moment. If the former, the disease manifests itself by redness and puffiness of the lids at from the second to the fifth day; if it does not appear until later, infection has taken place subsequent to birth. This may happen by the transference of secretions to the child's eyes in various ways, as by the hands of the attendant, by soiled linen or sponges, etc.: but the lochial discharge, as such, has been found to be incapable of causing the affection, if the woman be free from inflammatory disease.

The discovery of the gonococcus has led investigators to examine the secretion of purulent ophthalmia for the same organism—and in the vast majority of cases examined, it has been found to be present therein also; still, different observers appear to have reached results not entirely in accordance as to the relative frequency with which this organism is present. Cases do occur in which it cannot be found. Hence the attempt has been made from a bacteriological point of view to recognize different forms of the disease—a specific form and simple inflammatory forms. As stated above, the *secretion of simple vaginal catarrhs* is capable of causing purulent ophthalmia.

Formerly this disease was attributed to a variety of causes, such as injuries received by the eyes during birth, icterus, chilling of the body, intense light, etc., but these views are, of course, no longer entertained.

It is hardly too much to say that *no one should become blind from this disease;* not only because it is quite amenable to treatment, if this be instituted from the beginning, but because the disease itself can be prevented in most instances if those who have the care of mother and child understand the nature of the affection.

From the facts and figures above given it will be seen that this is simply another way of saying that *one-third of those who are now blind might have been saved from this calamity.*

THE PRECAUTIONS NECESSARY TO PREVENT OPHTHALMIA OF THE NEWBORN AND THE RESULTANT BLINDNESS.

It will at once occur to the physician that if unhealthy discharges from the vagina of the mother are the cause, and the sole cause for this affection, it his duty to cure all conditions producing such discharges during pregnancy. If he does not succeed in this he can at least ren-

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der them harmless by washing out the vagina with a disinfecting solution during labor. The physician, however, will usually be sufficiently alive to the importance of this subject, and will also be competent to recognize and to treat cases of the disease when it has become fully developed, and thus prevent its termination in blindness. Dr. Schneideman, in a recent paper before the Philadelphia County Medical Society, says that "perfect recovery without damage to the cornea" is always attainable by prompt, vigorous treatment and assiduous attention. Preventive and not remedial measures are, however, the subject of this circular.

The plan now adopted by scientific physicians is that known as the *Credé* method, from the name of the physician who introduced it. It consists in first carefully washing out the eyes of the child with pure warm water, and then dropping into them one or two drops of a two per cent. solution of nitrate of silver. If all the environments of the child are hygienic and the physician is sure of the healthy condition of the vaginal mucuous membrane, the first measure will be all that is necessary; but, under all other circumstances, the second should never be neglected. The proof of the good results of this simple precaution is overwhelming.

Dr. Lucius Howe, of Buffalo, has collected two lists of cases, the first showing the results obtained and published by different obstetricians who used no treatment for the eyes of 8,798 children born under their care. Among these 8.66 per cent. had ophthalmia in a greater or less degree.

The second list of 8,574 shows the results of the Credé treatment. In these cases there were only 0.65 per cent. In the lying-in hospital of Leipsic, where Credé instituted his own method, the percentage fell from 7.5 to 0.5 per cent. The advantages of Credé's method have been recognized by its official recommendation in Austria, Germany, Switzerland and France.

NECESSITY FOR SPECIAL INSTRUCTION OF NURSES AND MIDWIVES.

In view of these incontrovertible facts it becomes the duty of all physicians who are engaged in the instruction of nurses and midwives, under whose care rather than that of the thoroughly qualified physician these cases are apt to occur, to impress upon them the terrible risks incurred by neglect of cleanliness in this particular, and to require of them an intelligent appreciation of the importance of the subject and an acquaintance with the signs of commencing inflammation of the eyes and of the methods above detailed.

This class of attendants on lying-in women should never attempt to treat the inflamed eyes of the new-born infant themselves, but should always place the case under the charge of a physician. In many European countries this is made obligatory. The State of New York has

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had a law in operation for more than a year, requiring midwives and nurses to report every case of inflamed or reddened eyes occurring within two weeks after birth, to some legally qualified practitioner within six hours after discovery, under a penalty of a fine or imprisonment or both.

Deeply impressed with the importance of this subject and feeling the responsibility which rests upon it to use the authority conferred upon it for the diminution of this serious disability, the State Board of Health of Pennsylvania has formally adopted and hereby promulgates the following regulation:

REGULATION V.

For the Prevention of Blindness.

Whenever, in any city, borough, village or place in this State having no health authority of its own, any person, mid-wife or other person, not a legally qualified practitioner of medicine, shall notice inflammation of the eyes or inflammation of the lids in a new-born child under his or her care, it shall be the duty of such person to report the same to some legally qualified practitioner of medicine, within twelve hours of the time the disease is first noticed.

RECOMMENDATION TO MUNICIPAL COUNCILS AND BOARDS OF HEALTH.

And furthermore this Board urgently recommends the passage of a similar ordinance by the councils of all cities and boroughs having health authorities of their own, or the adoption of a similar regulation by such health authorities.

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7. CIRCULAR NO. 36. SANITARY PROTECTIVE ASSOCIATIONS; OR LIFE INSURANCE WHICH DOES INSURE LIFE.*

All are familiar with the idea and principles of life insurance. The gigantic development of this idea in its business aspect in these later days has astonished all thinking men. Its palaces form the chief ornaments of the principal streets in our cities. Its agents swarm like locusts through the land. Like "pallid death," this familiar and intrepid visitor knocks alike at the mansion of the opulent and the poor man's cabin. Like the congress of the late ill-starred confederacy, he is ready to "rob both the cradle and the grave." Far be it from me to discourage his well-meant, though occasionally, perhaps, somewhat irritatingly persistent presentation of his well-worn theme, or to belittle the good which has been accomplished through his efforts, and the beneficent results of the system. But am I not justified in saying that the system

*Read before the Pennsylvania State Sanitary Convention, at Lewisburg, and adopted as a circular by the State Board of Health.

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is misnamed? That it is really not *life* insurance, but *death* insurance? That by just so much as a man's life is shortened, is the value of the pecuniary provision which he thus makes for his surviving family increased? That the man who dies within a year after taking out his policy, makes a better thing of it from a business point of view, than he who lives on for twenty or thirty years, paying his premiums every year? So well is this fact understood, that the companies have thought it necessary to remove the temptation thus held out to the policy holders to shorten their lives, by declaring that suicide shall be a ground for voiding the contract. In direct contrast to this somewhat depressing, though eminently useful form of associate action for mutual benefit, I desire to call attention to another kind of association, the direct object and proven result of which is to lengthen the lives of those participating in it, and which may therefore lay claim to the title of the *True Life Insurance*. Nor does it promise length of days alone. For while its right hand holds out that precious guerdon, in its left are the "riches and honor," which necessarily flow from the possession of a sound mind in a sound body. To the citizens of Edinburgh, Scotland, belongs the honor of having originated the conception of a voluntary combination and pooling of resources for the purpose of mutual life and health insurance. This was embodied in the "Sanitary Protective Association of Edinburgh," just ten years ago, and the movement has been in successful operation ever since.

The following is a "General outline of the Objects of the Association and Privileges of Members:"

First. To provide its members, at moderate cost, with such advice and supervision as shall insure proper sanitary condition of their own dwellings.

Second. To enable members to procure practical advice on moderate terms, as to the best means of remedying defects in houses of the poorer class in which they may be interested.

Third. To aid in improving the sanitary condition of the city.

The first inspection does not cause any disturbance to household arrangements. It is followed by a report making specific recommendations, if any improvements in the household arrangements are thought necessary. The members are not bound to carry out these recommendations. The subsequent annual inspection will, so long as the sanitary arrangements remain in working order, entail no expense beyond the annual subscription.

The following is a formal statement of the privileges of members. The annual inspection spoken of in the second paragraph, will form the main business of the association. It is believed that no system of drains, or other sanitary appliances, can be depended upon to remain in perfect order without skilled inspection; and this skilled inspection can be cheaply and efficiently provided by the association.

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Each member is entitled to the following privileges in respect of property within the municipalty:

1. An immediate report by the inspecting engineer of the association on the sanitary conditions of one dwelling or property, with specific recommendations, if necessary, as to the improvement of drainage, water supply and ventilation, and a report upon the water by the analyst.

2. An annual inspection of his premises, with a report as to their sanitary condition.

3. Occasional supplementary inspection and advice concerning the dwelling or property in respect of which he is a subscriber.

4. Each member by his annual payment secures the above privileges in respect of one dwelling or property, occupied or designated by him. Should he be interested in two or more dwellings or properties, as owner or occupant, he may secure equal privileges in respect to them all, by paying the annual subscription for each.

5. A report, to be obtainable on payment of a special fee, on any dwelling or property, or plans thereof, which he may wish to hire or purchase.

6. Reports by the officers of the association as to the sanitary condition of any dwellings or properties of the very poor, on payment of a moderate fee.

7. A report without fee, upon the sanitary condition of any public building, as church, school house or place of public resort, within the city.

So great a degree of public confidence did the association inspire by the thoroughness of its inspections and the practical wisdom of its suggestions for sanitary improvement in individual cases, that it was announced at its sixth annual meeting that the Bank of Scotland had by a recent resolution, placed the whole of their branch banks throughout the country, numbering about one hundred, under the supervision of the association as regards sanitary matters. The remarkable apathy of the class of people, who would have at once joined a sanitary association, viz: the hotel keepers and lodging house keepers, was, however, strongly commented upon. This need not to be wondered at, when it is borne in mind that, out of hundreds, only two of the class referred to, applied for inspection. It is only by reading reports of this kind, said the *British Medical Journal*, of April 7, 1883, that one can form an idea of the insanitary condition of our houses. The report showed that 612 inspections had been made in the course of the year. About one hundred country houses had been inspected and reported upon, and among them ninety per cent. were found to have direct communication existing between their drains and the interior of the house; eighty per cent. their water storage more or less faulty; and no less than fifteen per cent. had the main cisterns in direct communication with large brick cesspools, filled with putrefying filth.

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The example of Edinburgh was quickly followed by certain public-spirited and enlightened citizens of Newport, R. I., who, in November of the same year (1878), established the *Sanitary Protective Association of Newport.* The rapid growth of that popular seaside resort and the immense increase of its population during the summer months, had completely outstripped the limited system provided by the town authorities for disposing of the waste of all kinds, which such an aggregation of human beings would lead to. It was necessary that some concerted action of a positive nature should be taken, if the fair fame of the city, as a health resort, was to be saved from reproach.

The secretary of the association in his second annual report, said—and with the substitution of "mountains" for "sea," his assertions would not be inapplicable to many a town in Pennsylvania:

"The inhabitants of Newport, owing to the situation of their city, have always enjoyed remarkably good health, and the fact that this has been the case, is looked upon by them with pride and satisfaction, and they have been unwilling to open their eyes to the present or to look forward to the future. It is sufficient that the pure air of heaven has, in the past, brought health and longevity to them, and it is taken as a matter of course, that such will be the case for all time to come.

"To be sure the breezes, as they blow fresh from the sea, are pure as of old, but as they come sweeping through the now thickly populated town, passing through back yards filled with mire of slops and filth, and over stagnant water and marsh, the receptacles of garbage and sewage, the pure oxygen is soon contaminated with gases which are not health-giving, though they may not immediately kill.

"There was a time when wells dug down into the solid rock furnished pure spring water. By an occasional cleaning of the well, one generation after another could go on using this water without a doubt of its purity. But estates have been divided and sub divided, other wells have been sunk, and new cesspits dug, the latter, perhaps, on account of the narrow limits of the place, close to the well of some old homestead.

"Soon the soil becomes impregnated by the liquid filth, and, naturally, the water of the wells in the neighborhood is infected. This has continued until it is the exception where the water of a well is found fit for domestic purposes.

"In some portions of the city, owing to the neglect of the public authorities to remedy existing evils, the air became laden with poison germs, and so reduced the system of many that they readily fell victims to any contagious disease which might spring into existence.

"The importance of placing under strict supervision the inmates of a house where such diseases existed, was overlooked, so that the death rate of Newport, though small as compared with other cities, was large in those diseases which might have been prevented.

"Eminent physicians, summer residents of Newport, anxious as well for

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the reputation of the city, as to adapt the place to the necessities of city patients, alluded in print to the importance of measures being taken to improve its sanitary defects, and complaints were addressed to the city authorities by native physicians and others. But these appeals were unwelcome and unheeded, and, far from what was earnestly desired, resulted in openly expressed ingratitude to the authors of them.

"Although the Board of Aldermen were empowered by the State to appoint a Board of Health, which should have all the powers and duties conferred upon the Board of Aldermen, as a Board of Health, and notwithstanding the wish of the people, and a memorial signed by the physicians of the city, yet they practically refused to exercise their powers, nor would they confer them upon others."

A better idea of the scope of the work which it laid out for itself and the searching character of their reforms which it desires to effect, cannot be given than by reference to a circular issued in the second year of the existence of the association. It says:

The sanitary condition of houses and cities has been, for the past few years, occupying the attention of physicians, sanitarians and scientific minds throughout the civilized world to such an extent, that all intelligent men are now keenly alive to the importance of proper sanitary surroundings and especially the sanitary condition of their own individual habitations. The questions now arise in the minds of every one, whether they are occupying houses of their own or hired houses, or are about to seek a new house:

(*a.*) Are the sanitary surroundings of the house perfect? Do the trees and shrubbery permit sufficient exposure of it to the sun?

(*b*). Is the water pure and drinkable? If from a well or cistern, has it connection with the external air?

(*b*1). Is there direct connection for cooking and table use, where city water is employed, between the main and the kitchen? (Adopted June 13, 1882.)

(*c*). Is the cellar dry, well ventilated and free from decomposing matter, which may give forth seeds of sickness and death, and has it a drain? This drain must be wholly unconnected with any sewer.

(*d*) Is the cellar air entirely excluded from the air supply of the furnace?

(*e*). Has every bed chamber free ventilation and direct means of communication with the external air?

(*f*). If contagious or infectious disease has occurred in the house, have the sick chamber, etc., (bedding, wearing apparel, curtains, carpet and upholstered furniture), been thoroughly disinfected, and the wall paper removed?

(*g*). Has each water closet means of external ventilation and not into an entry or bed chamber?

(*g*). Is provision made for ventilation of the interior space of the

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water closet, by a current of air flowing through the same to a ventilating pipe or flue, passing above the house-top, and independent of the soil pipe or its extension? (Adopted September 13, 1881).

(*h*). Are the soil pipes in a sound condition and easily accessible for examination? Are they of iron, with lead plugged joints (the only true condition for a properly constructed soil pipe), or are they of lead, have they been in the house for a number of years, and thus become perforated with holes, through which sewer gas escapes into the house?

(*i*). Has the soil pipe a proper vent through the roof?

(*j*). Is the soil pipe in its exit through the foundation of the house, of iron or of earthenware? If of the latter, is it broken off in or just outside of the foundation, so as to allow the sewage matter of the house to find its way through the foundation (a condition which is almost always found to exist where earthenware pipes are used)?

(*k*). If there are set bath tubs, basins or wash tubs, are they securely trapped? Is the kitchen sink safely trapped? It must not be forgotten that the ordinary bell trap does not perfectly exclude sewer gas, which its water absorbs and transmits, and that the S trap is liable to be "syphoned," or emptied by inward suction, so as to permit the escape of gas into the house from the soil pipe or drain.

(*l*). Is the waste-water pipe of the refrigerator entirely cut off from all connection with the soil pipe?

(*m*). Is the cesspool near the foundation wall? Is the cesspool a loose one, and is there any overflow or leakage into the foundation, cistern or well?

If all these conditions are answered to the satisfaction of a sanitarian, then one may consider his home in a healthy condition, and the occupants of it free from all danger of contracting diphtheria or typhoid fever from it. It is the almost universal opinion of physicians that every case of diphtheria and typhoid fever is preventable, and that wherever a case occurs, there are some bad sanitary surroundings. Even where diphtheria, like scarlet fever, has originated from direct contagion, it is probable that exposure to unhealthy influence at home has predisposed the individual to contract the disease more easily, and it is certain that such conditions render both of these diseases more liable to become fatal. When these facts are substantiated does it not behoove every one to see that his house is put in order?

With a house in perfect sanitary condition (which it is possible for every one to have), many deaths, and a vast amount of sickness and physical debility will be saved, and the period of life lengthened.

How many householders are there who are competent to answer all these questions intelligently? Especially those in regard to the arrangement and condition of plumbing, sewerage and drainage? Now

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it is precisely to provide a system by means of which every owner of a home may have them accurately and understandingly answered, and in case the answers are unfavorable, can have the defects which they indicate remedied, and his home put in a thoroughly safe condition, that I suggest the formation in every town in the State of a sanitary protective association. And in order to facilitate the inauguration of such a movement, I have prepared a draft of articles of association which may serve as a guide to any who desire to undertake it. I have thought it advisable to make them as brief as possible, so that in the event of its being deemed advisable by the association, they could be made use of as a charter, leaving the duty of framing by-laws for the administration of the affairs of the association to the council, after it has had an opportunity to study the field of work and ascertain its requirements. I desire to preface it, however, by the statement that it is not intended that such an association should substitute or conflict with municipal inspection, which cannot be too earnestly encouraged, but rather to supplement the action of the constituted authorities in protecting the public health.

Articles of Association of the Citizens' Sanitary Protective Association of . . . . . .

NAME.

We, the undersigned, citizens of . . . . . , and of the Commonwealth of Pennsylvania, do hereby associate ourselves together as an association, to be called "The Citizens' Sanitary Protective Association of . . . . . ."

OBJECTS.

The objects of this association and the purpose for which it is formed shall be:

First. To insure the proper sanitary condition of the dwellings of its members, by providing for their inspection at stated intervals, and at a moderate expense, by competent experts.

Second. To enable its members to procure practical advice, on moderate terms, as to the best means of remedying defects in the houses of the poor in which they may be interested.

Third. To aid the municipal authorities in improving the sanitary condition and sustaining the good repute of the city, by reporting to the proper department such infractions of its regulations as come under its observation and by any other means which in the opinion of its council may seem calculated to promote this object.

MEMBERS.

Any citizen may become a member upon the payment of an annual subscription of——— dollars until ———.

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After this date the council shall have the power to increase the annual payment to be made by new members, but not that made by original members.

COUNCIL.

The number of its directors who shall be styled the council, shall be eleven, four of whom shall at any time constitute a quorum. The Council shall manage the affairs of the association. Its members, who shall receive no remuneration, shall be elected by the members of the association from their own body. The council shall from their own body elect a president, vice-president, recording secretary, corresponding secretary and treasurer.

The council shall have power to frame by-laws for the better administration of the association, but not to alter the objects for which it was formed. The council shall meet as often as may be found necessary for the transaction of business, and shall have the power to call special meetings of the association.

The council shall appoint and shall have power to dismiss all paid officers of the association. These officers snall consist of a consulting engineer inspecting engineer and a chemical analyst.

The consulting engineer shall give advice to the council when requested to do so, both as to general principles and particular cases presenting any difficulty. His remuneration shall be fixed by the council, and based solely upon the amount and character of the services rendered.

The inspecting engineer shall visit the premises of members as soon as possible after receiving notification to do so, and shall in all cases report in writing to the council, who, when they have approved the report, will transmit the same to the member interested. In cases of emergency a verbal report shall also be made by him to the member interested. His remuneration shall be fixed by the council.

MEETINGS.

A meeting of the association shall be held annually on the . . . . . at . . . . . at . . . . . to hear the report of the council and to elect members of the council for the ensuing year.

PLACE.

The place in which the business of the association is to be transacted is the . . . . . .

TERM.

The term for which it is to exist is perpetual.

STOCK.

There is no capital stock and no shares. The funds of the association shall be held invested and disbursed by the council in accordance

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with the by-laws. But the annual income from such fund which the council may hold shall not exceed one thousand dollars.

SUBSCRIBERS.

The names and residences of the subscribers are as follows:

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

The Board entertains no doubt that the adoption of such a plan by a considerable number of the influential citizens of a town, would result, in the course of a year, in a decided decrease in sickness and death from that class of diseases which sanitarians call preventable.

The necessity of such voluntary associate action for the protection of the public health, is especially obvious in this State, in consequence of the failure of the legislature to make any provision for the establishment of official health authorities, outside of larger cities.

CIRCULAR NO. 7. REVISED PRECAUTIONS AGAINST CHOLERA.

PREVENTIVE PRECAUTIONS.

Filth is the home, nest and breeding place of cholera. The removal of filth beforehand is of infinitely more use than its attempted disinfection after the epidemic has begun. To this end it is essential:

1. To examine the condition of all public water supplies, and, if pollution is discovered, to cut off its source.

2. To examine the surroundings of all private wells with reference to the existence of causes of pollution.

3. To remove all house refuse, offal and garbage from the neighborhood of habitations, and either bury or burn it.

4. To use copperas, dry or in solution (a pound to the gallon of water), in all places which are in the least offensive.

5. To examine thoroughly all house plumbing and drainage, and remedy defects.

6. To thoroughly and frequently cleanse all cellars, out-houses, stables and pig-styes, using whitewash freely.

7. To drain all wet places in the immediate neighborhood of dwellings; and to drain, ventilate and, if necessary, cement damp cellars.

The organization of local boards of health in every city and borough, in the Commonwealth is of importance to aid in carrying out these suggestions, and local boards already in existence should act with energy

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and despatch on the first note of warning. Should our quarantine authorities, national and municipal, be successful in their efforts to prevent the introduction of this disease, it will be a satisfaction to know that no pains taken, no labor expended, no expense incurred in improving the sanitary condition of our towns and our homes, will have been wasted. These measures must inevitably result in diminishing the prevalence of other diseases which we have always with us, and which, in the long run, therefore, carry off more victims than cholera in its comparatively short, though terrible, stay. Should it make its appearance after we have thus put our habitations and surroundings into the complete state of preparation above recommended, we may view it with comparative indifference. It will not be wise, however, in its presence to neglect certain

PROTECTIVE PRECAUTIONS.

The cholera poison, whatever it be, is taken into the system through the mouth—that is, in food or drink. Simply being near a cholera patient cannot give you the disease. Therefore, have no fear of visiting a cholera-infected house on an errand of necessity or of mercy, or even of nursing a cholera stricken relative or friend. Still further, there is strong ground for believing that the natural juices of a healthy stomach will destroy the vitality of this poison. In Europe, during the last epidemic, the greatest number of new cases were usually reported on Monday mornings, Sunday being the day for dissipation among the working classes, and thus leaving them with disordered stomachs, incapable of destroying the activity of the virus before it reached the bowels, where alone it has the power of doing injury. It is, therefore, of the utmost importance to preserve a vigorous digestion by observing a few simple

PERSONAL PRECAUTIONS.

(1.) Avoid all excesses in food or drink, and especially in alcoholic drinks. (2.) Take your meals at regular intervals, and do not go into an infected house on an empty stomach. (3.) Avoid all intense excitement, violent exercise, colds from undue exposure, and the immoderate use of ice water. (4.) Do not restrict the range of your diet suddenly or exceedingly. (5.) Keep the skin in active condition by frequent bathing of the whole body with tepid water, and never eat without first washing the hands carefully. Cholera rarely attacks those who lead healthy, cleanly lives. Its victims are usually found among the dissipated, the careless and the dirty.

While thus placing your body in a thoroughly defensive condition, do not overlook the importance of

PRECAUTIONS IN REGARD TO FOOD.

(1.) Look upon unripe or over-ripe fruit or vegetables as so much poison, and do not allow your children to have pennies to buy the half-

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decayed fruit offered for sale on the street stands. (2.) It has been abundantly proved that heat destroys the potency of the cholera poison. Therefore, use no water for drinking, or for washing cooking and table utensils, which has not been thoroughly boiled. You will also err on the side of safety if you eat no uncooked fruit or vegetables. (3.) Milk is especially liable to convey infection, and should, therefore, always be boiled. (4.) If you use a filter, see that your water-cooler is rinsed carefully every day, and that the filtering material is frequently washed or changed. (5.) As sulphuric acid has been proven to possess the power of destroying the infectious material of cholera, if there is the slightest reason to suppose that the water is polluted, use the additional precaution of adding a tablespoonful of dilute sulphuric acid to every gallon of drinking water. This quantity will not render the water unpalatable. A little sugar may be added, however, if the acid is distasteful. In case of diarrhœa coming on, this acid mixture may be taken of six times the above strength, and frequently repeated in small doses until a physician can be summoned, which should always be done immediately, the patient meanwhile remaining on his back. (6.) As the infection may be carried in clothing, do not send your own to public laundries. If you do, that of cholera patients may be washed in the same water, and the disease may thus be brought back to your own house.

Should a member of your family be attacked with the disease, keep the patient in the house, as removal might be fatal, and send away the well members as far as practicable. Use the following

PRECAUTION IN THE SICK ROOM.

The infection resides in the discharges of the patient, whether from the stomach or the bowels, but especially from the latter, possibly from the bladder; therefore (1.) All such discharges should be received in a vessel containing about a pint of disinfecting solution, thoroughly mixed, and allowed to stand fifteen minutes, if possible, before emptying. If in the country, they should then be buried at least eight inches under ground, and remote from any well or running stream. (2.) Any clothing, bedding, towels, napkins, or handkerchiefs, soiled by a patient, should at once be immersed in a strong disinfecting solution, allowed to remain four hours, and then boiled or exposed to dry heat for four hours (230° Fahr.). (3.) After the recovery or death of the patient, as much of such clothing as can be dispensed with should be burned. All utensils used by the patient should be placed at once in a disinfecting solution before being washed. (4.) During convalescence all the discharges of the patient must be treated as if they were fresh cholera discharges. (5.) The dead should be enveloped in a sheet saturated with a disinfecting solution without previous washing of the body, and at once placed in a coffin. Burial should be immediate and private. The Board recommends the following

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DISINFECTING SOLUTIONS,

Principally suggested by the Committee on Disinfectants of the American Public Health Association:

For the Disinfection of the Discharges from the Patient.

1. *Standard Solution No. 1.*—Dissolve chloride of lime or bleaching powder of the best quality (containing at least twenty-five per cent. of available chlorine) in soft water in the proportion of six ounces to the gallon. Use one quart of this to each discharge.

2. *Standard Solution No. 2.*—Dissolve corrosive sublimate and permanganate of potash in soft water in the proportion of two drachms of each salt to the gallon. Use one gallon of this to each discharge.

(NOTE.—This solution is highly poisonous. 2. It requires a contact of one hour to be efficient. 3. It destroys lead pipes. 4. It is without odor).

3. *Standard Solution No. 3.*—To one part of Labarraque's solution of hypochlorite of soda (*liquor sodæ chloratæ*,—U. S. P.), add five parts of soft water. Use one gallon of this to each discharge.

For the Disinfection of Clothing, Towels, Bedding and other Textile Fabrics.

Standard Solution No. 4.—Dissolve corrosive sublimate in water in the proportion of four ounces to the gallon, and add one drachm of permanganate of potash to give color to the solution as a precaution against poisoning. One fluid ounce of this solution to the gallon of water is sufficiently strong. Articles should be left in it for two hours. One gallon of standard solution No. 1 may also be mixed with nine gallons of water, and used in the same way. No article should be allowed to leave the infected room until it has been either disinfected or boiled.

(NOTE.—Corrosive sublimate solutions should be kept in wooden or crockery vessels.)

For the Disinfection of Water-closets, Urinals, Sinks and Cess-pools.

4. *Carbolic Acid Solution.*—Mix one pint of carbolic acid with two and a half gallons of water.

Standard solution No. 4, diluted with three parts of water, may also be used in the proportion of one gallon (of the solution) to every four (estimated) of the contents of the vault. Standard solution No. 1 would require to be used gallon for gallon of the material to be disinfected. Dry chloride of lime may be sprinkled over the contents of a privy, or standard solution No. 2 may be made up by the barrel, and four or five gallons be applied daily during an epidemic.

For Disinfection of the Sick Room after it is Vacated.

Thorough ventilation for several days, and thorough washing of all surfaces with one of the disinfecting solutions, say, one pint of standard solution No. 4 to four gallons of water, or a quarter of a pint of solu-

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tion of hypochlorite of soda to a gallon of water. The walls and ceiling, if plastered, may be washed with this, and then whitewashed. All dust must be carefully washed (not brushed or swept) away from ledges, cracks, corners and crevices.

5. *Sulphuric Acid Solution.*—Sulphuric acid or oil of vitriol is often accessible when other disinfectants are not, and is very effective, in the proportion of one ounce to the gallon of water, for disinfecting cholera discharges; of the same strength for soiled clothing, and of half this strength for bathing the body of the sick, or the hands of the attendants, or sponging the clothing of attendants, and the floor and carpets, if they become soiled.

Precautions against Cholera Infantum.

Cholera Infantum (summer complaint) is the Herod of large American cities in this latitude during the summer season. In the city of Philadelphia it causes about one-twentieth of all the deaths for the entire year, and one-sixth of all the deaths of infants under two years of age; and this wholesale destruction of infant life takes place in the short space of two months. Continued high temperature, night and day, appears to be its essential cause. It is important, therefore, First: To keep the child cool, and, secondly, to keep its food (milk) cool. (Infants at the breast are much less liable to be attacked than those brought up by hand. Therefore, nurse the baby through the second summer, if possible.) To accomplish the first object, allow the baby to drink freely of cool (not excessively cold) water; bathe it frequently in cool or lukewarm water, two or three times a day if the thermometer is above 90°; keep it in the open air in the shade; take it into the country or out on the water as often as possible. Let it wear a very thin flannel undershirt, or if not this, a flannel belly band.

To accomplish the second, get your milk from a dairy where it is kept on ice, keep as little on hand as possible—and keep it on ice if possible As soon as you get it, boil it for a few minutes and then add a table spoonful of lime water to every pint. If the child is seized suddenly with diarrhœa, stop its milk at once, and feed it on raw white of egg, gelatine, barley water, and meat or chicken broth; and do not give it milk again until the diarrhœa has stopped. If possible go away with it to the country at once, or, if you live in the country, go to the mountains. Change of air has saved thousands of children's lives in this disease. Never try to treat looseness of the bowels in a baby in hot weather yourself, but send at once for a doctor. All the precautions suggested in this circular as to the necessity for cleaning up the house, cellar and yard in expectation of cholera, are equally important as regards cholera infantum.

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Precautions against Cholera Morbus, Summer Diarrhœa and Dysentery.

All of these well-known diseases occur principally during the summer and autumn.

Cholera morbus is caused by improper food and sudden chilling of the body after exposure to great heat. Certain substances will produce it in certain persons, such for instance as veal, raw milk taken with fish, or shell fish, and all dishes cooked with milk, such as rice pudding, cream puffs and even ice cream, when kept too long. Unripe and over-ripe fruit, especially if taken with large draughts of ice water, will also cause it. But sound, ripe fruit is a natural food in hot weather, and wholesome Avoid becoming chilled during sleep. In a climate as changeable as ours, a light blanket should always be at hand, to be drawn up in case it suddenly becomes cold during the night. Persistent summer diarrhœa is usually caused by malaria, sewer air or impure water. The conditions liable to contaminate air and water should be carefully sought out and remedied as indicated in speaking of Asiatic cholera. The water can be rendered safe by boiling. As dysentery is often epidemic, it is wise to consider every case as a possible source of danger to others, and to disinfect the discharges with the same care and in the same manner as already directed for those of Asiatic cholera.

BENJAMIN LEE, M. D., *Secretary,*
Philadelphia, Pa.

CIRCULAR LETTER TO BOARDS OF HEALTH AND MUNICIPAL AUTHORITIES.

COMMONWEALTH OF PENNSYLVANIA,
STATE BOARD OF HEALTH,
EXECUTIVE OFFICE, 1532 PINE STREET,
PHILADELPHIA, ...

To the Burgess and Council of . . . . . .

GENTLEMEN: The attention of your honorable body is called to the enclosed copies of a circular of instructions of the State Board of Health, of the proclamation of His Excellency, the Governor of the State, and of the model ordinance of this Board, all of which have been already sent you.

Complaint has been made to this Board that you have disregarded your solemn obligations in this respect, thus leaving your town a prey to the ravages of cholera, should it be introduced. Especial complaint is made of———.

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I desire an immediate reply, stating whether the complaint is well-founded, and, if so, what excuse you have to offer for this gross neglect of official duty.

Yours respectfully,

BENJAMIN LEE,
Secretary.

SCHOOL HYGIENE ADDRESSED TO SCHOOL DIRECTORS, CONTROLLERS AND TRUSTEES.

I. SELECTION OF A SITE FOR A SCHOOL.

For a school house it is desirable to secure the healthiest possible site in the district where the school is to be located. Pure air and sunlight in abundance, are to be sought, while foul air and dampness are to be avoided. In the country, a damp soil and the region of wet weather ponds are always to be avoided. A hillside, because it is dryer and warmer, is better than a hollow, or than the top of a hill, if the latter is exposed to bleak and cold winds. In towns it is not necessary to locate the school house on a principal street; a quiet side street is preferable. It should be located away from offensive industries, as gas works, tanneries, oil refineries, etc., while the school lot should be so large that two sides have the adjacent buildings at least sixty feet distant, and, in both town and country, a play ground as large as possible should be secured. This should be on the south and west sides of the school buildings, rather than on the north.

The school grounds may be planted with trees; but these *should not overshadow the buildings*, thus producing dampness, nor should they be permitted to darken the windows. In the country, in exposed situations, wind-breaks of evergreen trees may be planted on the north or north-west side of the building, and in some localities on the south-east, to protect from the cold winds coming from those directions. To secure a large lot it would, in towns, be well to go to the suburbs rather than to build in the seemingly most convenient spot. In rural districts, children frequently walk one, two, and even more miles to school, and it would seem that in towns and cities, where there are well-kept sidewalks, children could do as much when necessary. It is a matter of surpassing importance, that there be a considerable area of open ground about every school house, and great exertion should be made to secure it.

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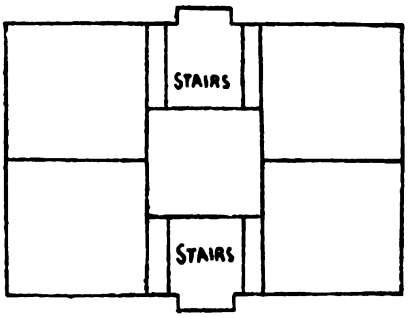
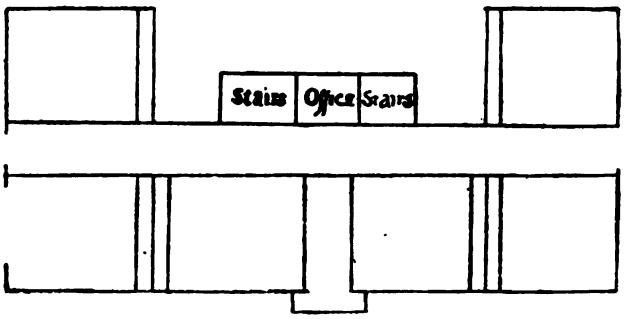
II. PLANS FOR A SCHOOL BUILDING.

No committee should erect a new school building without the most careful consideration and study of improved school house plans.* A cellar should be made under the whole building, and should be at least half above ground, with good large windows and a cemented floor. It could then be used for a play room in wet weather. If there is no cellar there should at least be an air space under the building for ventilation.



No. 1.—Plan of school building to give maximum of light in each room. (From Lincoln's Sanitary Conditions of School Houses.)

To secure dry walls, they should be under-drained, and a damp-proof course of slate should be laid under the first set of joists. The building should not be over two stories high, and should secure to each pupil three hundred cubic feet of air space with fifteen square feet of floor space. The walls within should be "furred out;" that is, have the plastering put on lath, not directly on the walls. This makes the building dryer and warmer. The rooms should not be in the form of squares, but of parallelograms, and not over 40 feet by 24 feet in area. This being the greatest distance rooms that can be well lighted and pupils see across to blackboards, etc. Ceilings should be about thirteen to fourteen feet high, not more. The walls should be whitewashed or painted, never papered. Buildings should be so faced that the sun can enter every room. All exterior decorations which cut off the light are



No. 2.—Plan of school building; an improvement of No. 1. (From Lincoln.)

to be avoided. The floors should be of hard wood, oiled and free from splinters. The cloak rooms should have good means of ventilation, and should be lighted.

*See list of books recommended at close of this circular.

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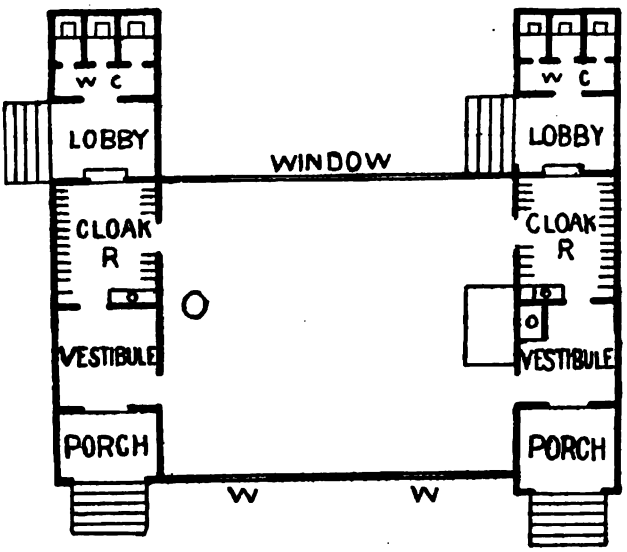
Staircases should be fire-proof, with rails on each side, without any winding; every tread being full size. There should be a staircase for every fifty pupils. Doors should open outward, and should be of good width. For country schools, and for all schools on large lots, it is probably best to face the building to the east or west. This will bring the windows to the north and south, which, generally, will give the best results in lighting the room.



Plan for a single-roomed school. (Gardner.)

HEATING.

A proper degree of warmth and pure air are absolutely essential in all school rooms. The effort should always be made to secure ventilation in connection with the heating of a building, as this is the best and least expensive method.

Steam heat is the most convenient and most cleanly, but generally there is no ventilation accompanying it. If so it is to be rejected. Except in large towns or cities, heating must be done by stoves or by heaters placed in the cellar. Good results may be obtained from either.

From 68° to 70° Fahr. is about the proper temperature for a school, and this should be determined by a thermometer, which every school room should possess. This should be hung about three feet from the floor and in a portion of the room where an average temperature will be indicated. The stove or furnace should be large enough to heat without being made "red hot." Ventilating shafts, in order to be efficient, *must be heated;* they should be not less than eight inches square on the inside, and made smooth, preferably of metal. A card of instructions to teachers and janitors in reference to heating and ventilation should hang

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in each school room. For drying the children's feet, a large flat piece of iron, resting directly upon a steam coil, placed in the halls, is excellent.

CARD OF INSTRUCTIONS FOR JANITORS AND TEACHERS.

It is thought that a card with a few plain rules on lighting, heating, ventilating, etc., hung in each school room for the use of teachers and janitors would do good service. The following rules are suggested.

1. Windows should not be obstructed with flowers, clothing or curtains. If the curtains are hung at the top of the windows, see that they are rolled up tight on dark days.

2. The thermometer should be hung remote from the heater or stove, and three to five feet from the floor. The room should be kept at a temperature of about 68° to 70° Fahr.

3. The air in all rooms should be kept pure and free from odors. But no pupil should be compelled to sit in a draught made by lowering any window, or from open door. All school rooms should have the air in them completely changed each noon hour, and in the evening after the school is dismissed.

4. All rooms should be kept free from dust. All closets should be kept clean. The blackboards should be free from grease. The water closets should be clean at all times. The cellar should be clean. There should be no filth on the school ground at any time.

5. Children suffering from contagious diseases, or coming from families in which such diseases exist, should be reported to the proper authorities at once.

6. Any violation of these rules should be at once reported.

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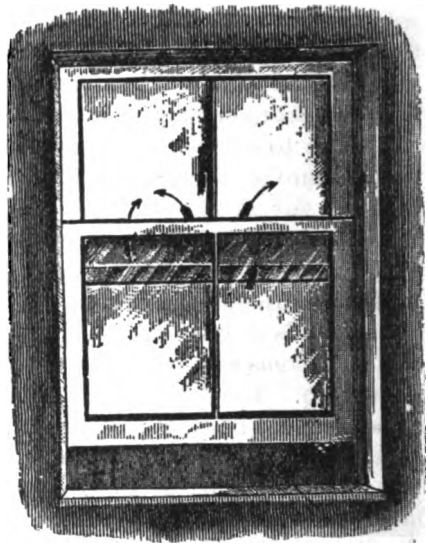
VENTILATING.

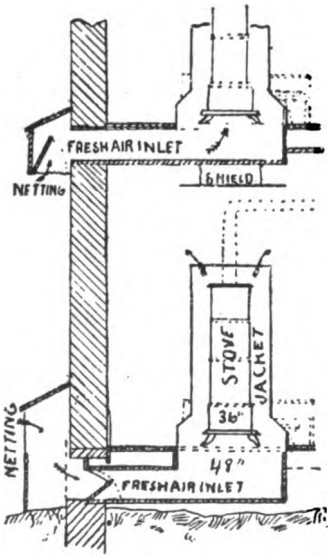
A simple plan of ventilation, by means of one central shaft, is given in the cut. About 2,000 feet of fresh air per hour to each pupil is needed.

An open fire-place, with a small fire burning in it, is the best means of ventilating a room yet devised. *A ventilating flue, in order to act, must be warm,* otherwise it will probably only be a funnel down which cold air will pour into the room. Windows should not be lowered in cold weather when a draught of cold air may fall upon the head of any pupil. Much fresh air may be introduced into a room by placing boards or strips of muslin about six inches wide under the lower sash of each window in the room. A space will be formed between the two sashes through which a stream of air will enter the room.



Showing manner of ventilating by inserting strip of wood beneath lower sash of window.

Another plan is to have a cylinder of zinc enclosing the stove. A hole is made in the floor underneath the stove, and from this hole a piece of stovepipe leads to the external air. The air about the stove will become heated and will arise, while to take its place a constant stream of air will pour into the space about the stove from out doors. This air will be warmed before it passes into the room. It will be well for the teacher to have *fixed times on the daily program at which* to throw open doors and windows several times each day, that all the stagnant air may be removed from the room. At these times all the children should be on their feet exercising, and the windows should be closed some minutes before the children take their seats, in cold weather. All windows should be made so that they can be lowered. This especially applies to one-roomed country schools. Foul air produces listlessness in schools perhaps more than any other one cause.



Foul air poisons the blood and dulls the operations of the brain; hence, good work cannot possibly be done in an ill-ventilated

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school room. The teacher will become impatient and petulant, the children dull and listless. Hence it is clear that *much attention* should be given to securing pure air in all school rooms.

LIGHTING.

Great pains should be taken to secure a well-lighted building. The school house should stand alone, no other building being nearer than 60 feet, and if very high, still more distant. The rooms should not be much over 33 feet by 21 feet in size. Window space should equal one-fourth to one-fifth of the floor space, placed on two sides of the room, and the windows should extend to the ceiling, while the lower sill should not be nearer than four feet from the floor. It is the rule that windows are much too small. Shades, if any are permitted, should have the roller at the bottom. Teachers should not be permitted to obstruct the windows with curtains, flowers, or any other objects.

To keep out heat, blinds on the *outside of the glass* are much the best. Pupils should never be required to face the light; and the light is best when it comes from behind and over the left shoulder.

Walls are best of light gray color; ceilings white. Dark paint or dark paper should never be used on the walls of school rooms. It is best not to use paper at all. Blackboards should not be placed between windows where pupils must face the light in reading from them.

Books with good paper and good print should be used, and no others. This applies to books of reference and supplementary readers, as well as to the books considered as the more regular text-books.

It would be well for directors and school trustees to have hanging on the walls of every school room plain rules for the prevention of injuries to the eyesight.

RULES FOR CARE OF THE EYESIGHT.

Defects of vision have become so common among American school children that it is imperative that every exertion be made to lessen them. Rules have been compiled by the State Board of Health, which will be sent free to all school boards requesting them. Ask for Circular No. 38, on Care of the Eye. It would be well to have them printed on card board, and hung in every school room.

WATER SUPPLY.

Growing boys and girls need much drinking water; hence every school should have a good supply. In country places the well or spring should be at least 200 feet from the privy. The well should be cleaned at the opening of each school term, and the purity of the water tested. Each child (or at least the children from one family) should have his own glass or tin cup for drinking purposes. In country places, a wash basin and in towns, a hydrant, but no towel or soap, should be supplied the

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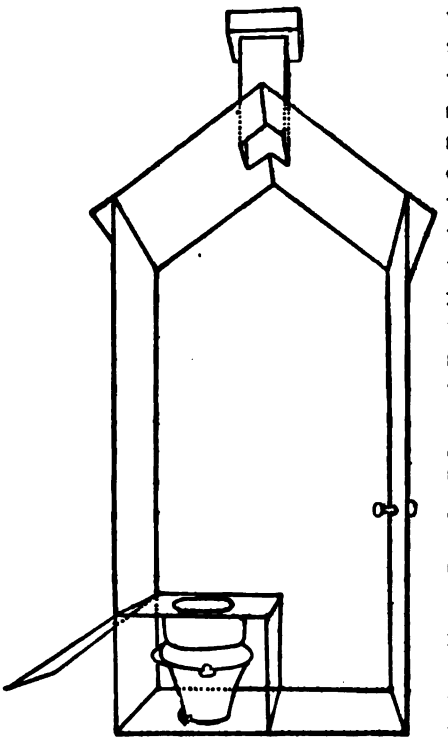
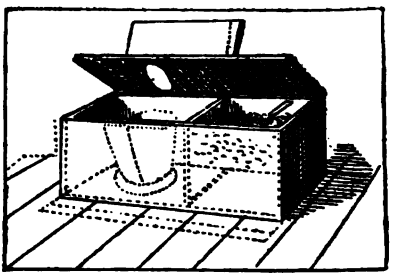
pupils. This last precaution is made necessary from the danger of spreading contagious diseases where the same towels, etc., are used promiscuously.

DRAINAGE.

The privies should be absolutely distinct for each sex, "out of sight and out of mind" each from the other. There should be as little woodwork as possible about them, and they should be well ventilated and well lighted. In country places, some form of the earth closet should always be adopted in preference to the dangerous privy vault. Dry paths should lead to the closets, so that in damp weather, pupils need not wet their feet in visiting them. In towns, when the water closet is used they should be constructed in the best possible manner. The floors should be of slate or asphalt, because these absorb no moisture. The urinals should not be of metal or of stone, but of glazed ware, as this can be kept clean most easily. The hopper closet is much to be preferred to the basin closet. It is much better to place the closets outside the school building, rather than in the cellar, as in the latter there will always be some danger from foul gas, and they will need constant watching. Sewage from a school (as also from all other buildings) should always be purified before being thrown into a stream, in order to avoid the contamination of water supplies. Human excreta are poisonous to human beings when again taken into the system; besides, they often contain the germs of fatal diseases, like typhoid fever, cholera, dysentery, etc., for which reasons care should always be taken to keep them from all water supplies.



Convenient closet, pail system.



Convenient form of earth closet for teacher's use. May be placed in any small room. It should be ventilated by means of a pipe leading to the chimney.

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GENERAL CLEANLINESS OF PREMISES.

Every portion of school premises should be daily inspected by the teacher and kept in a cleanly condition. Special attention should be given to the cellar, urinals and water closets. The cellar should not be used to store litter in, should be frequently whitewashed, and, if need be, disinfected. The urinals and closets should be frequently disinfected, and the aim should be to permit no odor to arise from these places. Green vitriol, a pound to a pail of hot water is an excellent disinfectant for such places. Neighboring streets, alleys and premises should also be reported to the health officers whenever not in a healthful condition.

Every school house should be thoroughly cleaned at the opening of each new year, and oftener if necessary.

SCHOOL FURNITURE.

The desks should be carefully selected and arranged, the following points being in mind:

1. The pupil should not sit facing the light.
2. The desks should be neither too high nor too low.
3. The top should slope to the pupil and not be flat.
4. The seat should be comfortable, with a support for the back, curved in to fit the hollow of the back, and not too far from the desk.
5. In every room for, say thirty to fifty pupils, there should be three sizes of desks. Foot rests should be supplied for those whose feet do not reach the floor.

The blackboards should be large, the surfaces dull, never varnished, and they should not be placed between windows. All wall maps and charts should be on a large scale, with large figures and letters. Teachers should be instructed to write in a bold hand, putting on plenty of chalk. The boards should be kept clean.

6. Every school room should possess a reliable thermometer.

THE HOURS OF STUDY.

It is a general belief that American children are being over-worked in the schools, and that their bodies are suffering from the confinement of the school room. Possibly children would advance just as rapidly in their studies were they in school no more than *half as long each day as* they now are. The following schedule may be an aid in making school programs: "Children seven to eight years old may be in school two hours a day; from eight to ten years old, three to three and a half hours; from ten to twelve, four to four and a half hours; twelve to fifteen years, five to six hours; and fifteen to eighteen years old, seven to eight hours." This schedule suggests a fair average of school hours, and includes *all* the time that children of the indicated ages may profitably spend over their books. Night study is not needed unless to a very limited extent.

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More time than this will probably be at the expense of their physical health. Pupils should have their meals at regular hours. They should not be overtaxed in "preparing for examination."

Sound bodies are of so great importance to the rising generation, that the attention of directors is especially called to this topic. In case of ungraded schools, the younger children should positively not be confined to the school room as many hours as the older ones.

RECESSES.

There is a tendency to abolish all recess and noon periods. *This is a mistake*, unless the hours at school are *very much* shortened. The one session plan is not to be commended for pupils unless eighteen or twenty years of age. The objections to it are, the children are too long over their books at one time, and the regular meal hours are interfered with.

PLAYGROUNDS.

Every rural school ought to have a good playground. It should be large, dry and partly shaded. Trees ought not to be so near the school house as to overshadow it and obstruct the light entering the windows. If, in cities, it is not otherwise possible to secure a playground, one should be made in the cellar, or even on the roof, or possibly in both places, one being assigned to the boys, the other to the girls, where both sexes are in the same school.

CONTAGIOUS DISEASES.

There is no longer any doubt that the contagious diseases of childhood are *largely spread through the instrumentality of the schools.* In cases of epidemics, it has been proven time and time again, that if the schools are closed, the epidemic dies out, or, that mainly the children who attend the schools infected, contract these diseases. Children who are suffering from consumption in a pronounced form, should not be permitted to attend any school. In no case should either pupil or teacher spit upon the floor, or into the hot air registers.

All children should be vaccinated before being admitted to school. All pupils or teachers suffering from diphtheria, scarlet fever, small-pox, varioloid, measles, or contagious diseases of the eye or skin, ought to be excluded from school until pronounced cured and innocuous to other children. When any of the above diseases are in a family, all the children of that family should be excluded from school so long as danger of communicating the disease exists. Teachers should be required to report all cases of contagious diseases in their schools to the health officer or burgess. When any of the above diseases are epidemic in a community, the schools ought to be closed until the disease subsides. The books which have been used by sick children will be infected and should be

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burned. The following statement of periods of infectiousness, taken from Abel's School Hygiene, may be of value:

PERIODS OF INFECTIOUSNESS OF CONTAGIOUS DISEASES.

Small-pox.—Six weeks from the commencement of the disease if every scab has fallen off.

Chicken-pox.—Three weeks from the commencement of the disease, if every scab has fallen off.

Scarlet fever.—Six weeks from the commencement of the disease, if the peeling has ceased and there is no sore nose.

Diphtheria.—Six weeks from the commencement of the disease, if sore throat and other signs of the disease have disappeared.

Measles.—Three weeks from the commencement of the disease, if all rash and the cough have ceased.

Mumps.—Three weeks from the commencement of the disease, if all swelling has subsided.

Typhus.—Four weeks from the commencement of the disease, if strength is re-established.

Typhoid.—Six weeks from the commencement of the disease, if strength is re-established.

Whooping cough.—Six weeks from the commencement of the disease, if all cough has ceased.

Under judicious treatment the period of infectiousness may be considerably shortened, but *no child suffering as above should be admitted to any school after a shorter period of absence, and should be provided with a medical certificate*, that he or she is not liable to communicate the disease.

LENGTH OF QUARANTINE.

Teachers or children *who have been exposed* to infection from any of the following diseases may safely be re-admitted to the school, if they remain in good health (and have taken proper means for disinfection) after the following periods of quarantine:

Diphtheria, ...	12 days.	
Scarlet fever, ...	14 "	
Small-pox, ...	18 "	
Measles, ...	18 "	Adults may be re-admitted immediately, if they disinfect their clothes and persons.
Chicken-pox, ...	18 "	
Mumps, ...	24 "	
Whooping cough, . . .	21 "	

No quarantine is necessary in case of exposure to typhoid fever.

The following rules, formulated by the State Board of Health of Wisconsin, we think ought to prevail throughout this State:

RULE 1. No person infected with any contagious or infectious disease dangerous to public health, shall be admitted into any public or private school within the jurisdiction of this Board.

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RULE 2. No parent, guardian, tutor or other person having charge or control of any child or children shall allow or permit any such child or children to go from any building infected with scarlet fever, diphtheria, cholera, small-pox or other contagious or infectious disease, dangerous to public health, to attend any public or private school within the jurisdiction of this board.

RULE 3. No parent, guardian, tutor or other person within the jurisdiction of this board having charge or control of any child or children shall allow or permit such child or children to go from any house or building infected with scarlet fever, diphtheria, cholera, small-pox or other contagious or infectious disease, to attend any public school, church or place of amusement, or to travel in any public vehicle.

RULE 4. No person within the jurisdiction of this board shall be allowed or permitted to go from any house or building infected with scarlet fever, diphtheria, cholera, small-pox or other contagious diseases dangerous to the public health, to attend any public school, church or place of amusement, or to travel in any public vehicle.

BLANKS FOR CONTAGIOUS DISEASES.

The blanks employed in the city of Easton seeming to the State Board of Health to be very complete, they are here reproduced and recommended to all school officers. They are used as follows:

Upon the development of a contagious or infectious disease in a family, the physician immediately fills out *Blank No. 1*, and places it in the hands of the chief of police, who is health officer of the city. The chief thereupon visits the family of the patient and secures the data for *Blank No. 2*, which, when filled out, is reported at the office of the superintendent of public schools. Upon its receipt the superintendent fills out and issues *Blank No. 3*, which prevents any inmate of that house from school attendance, until the attending physician files in the office of the superintendent a certificate that the children of said family can be re-admitted to school without danger of conveying contagion. Upon the receipt of this last certificate the superintendent fills out and issues *Blank No. 4*.

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CONTAGIOUS OR INFECTIOUS DISEASES.

Stub of physician's return.

Name of patient, ...
When a minor. { Name of father, ...
Name of mother, ...
Ward, ...
Street and number, ...
Name of disease, ...
Date of report, ...
Physician, ...
Residence, ...

(No. 1.)

Name of patient, ... Age, ...
When a minor. { Name of father, ...
Name of mother, ...
Ward, ...
Street and number, ...
Name of disease, ...
Date of report, ...
Physician, ...
Residence, ...

CONTAGIOUS OR INFECTIOUS DISEASES.

Name of patient, ...
When a minor—Parents' names, ...
. . . . . .
Res. No . . . . , ... St., ... Ward.
Names of family attending school :
. . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
Reported . . . . . , 18 . . .
. . . . . , Physician.
Residence, No . . . . , ... Street.

(No. 2.)

Name of patient, ...
Name of disease, ...
When a minor, names of parents, ...
Residence : No . . . . , ... Street, ... Ward.
Names of those in this family attending school, are as follows :
Pupil's name, ... Teacher's name, ...
" " . . . . . " " . . . . . .
" " . . . . . " " . . . . . .
" " . . . . . " " . . . . . .
" " . . . . . " " . . . . . .
Reported . . . . . , 18 . . . . . Physician.
Residence : No . . . . , ... St.

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(No. 3.)

SUPERINTENDENT'S OFFICE.

. . . . . , 189 . .

. . . . . .

Teacher of . . . . . School No. . . . Room . . . . ,
. . . . . Building.

Official notice has been received at this office, that a case of . . . . . exists in the family of . . . . . , of which . . . . . , a pupil of your school, is a member.

Under the sanitary regulations of the district the pupil herein named is to be debarred of school attendance until the attending physician files, in this office, a certificate declaring that said pupil can be re-admitted to school without danger of conveying contagion.

. . . . . .

Superintendent.

(No. 4.)

SUPERINTENDENT'S OFFICE.

. . . . . , 189 . .

. . . . . .

Teacher of . . . . . School No. . . . Room . . . . ,
. . . . . Building.

The bearer . . . . . , who, for sanitary reasons, has been denied the privilege of school attendance, is hereby re-admitted to school agreeably to the advice of the attending physician.

. . . . . .

Superintendent.

SUGGESTIONS TO COUNTY SUPERINTENDENTS.

(From report of Wisconsin State Board of Health.)

In conclusion we advise that the following important recommendations be addressed to the county superintendents of the State, who are urged to present them to the attention of every school district board, to the end that our schools be placed in good sanitary condition:

Rule 1. To clean and perfect all sources of water supply, and, where schools have no water supply of their own, to furnish such.

Rule 2. In the absence of a better system, to prepare the windows and transoms, so that ventilation can be had without causing drafts, and that all schools introduce improved ventilating systems as soon as possible.

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Rule 3. To place buildings in good repair, with tight floors, good roofs and underpinnings.

Rule 4. To see that the grounds do not permit standing water, and to prepare gravel or board walks to keep the children's feet out of the mud.

Rule 5. Suitable closets for each of the sexes should be provided with every school house. They should be situated far enough away to secure privacy, be kept in good repair and cleaned and disinfected at least twice a month.

Rule 6. The rooms should be so warmed as to maintain an even temperature, and all be kept comfortable; stoves and furniture should be safe and in good order.

Rule 7. Rooms should not be overcrowded; not less than fifteen square feet of floor space and 215 cubic feet of air space should ever be allowed to each pupil.

Rule 8. Blackboards should not be placed between windows; the surface should be dead black, not glossy.

Rule 9. The light should, if possible, be admitted from the rear, or rear and left of the pupil—never from the front.

Rule 10. Desks and seats of different heights should be furnished to suit the size and age of pupils.

SCHOOL HEALTH OFFICERS.

In the ideal State, each school will have its own health officer, who will look after the construction, warming, ventilating and lighting of the school building. He will also examine each pupil at stated periods, and will have a general oversight of the sanitary condition of the school buildings and the health of each pupil. He may propose to boards sanitary rules, and give teachers instruction in hygiene, and may make suggestions as to proper text-books for use in the schools. It is earnestly urged upon boards of control that these health officers be selected and set to work at the earliest practicable moment.

CO-OPERATION OF PARENTS.

Some of the best sanitary results can only be obtained through the co-operation of parents. They need to be shown that their children should not attend school too young. They should start to school with fairly developed and healthy bodies, for which parents are in large measure responsible. Children should be well fed, should be taught at home regular habits, and should sleep from eight to ten hours every night. Parents should care for the general health of their children and see that on holidays they have a chance to secure fresh air and exercise.

BOOKS OF REFERENCE.

The following books are valuable and should be in all school libraries:

School Hygiene.—Six lectures delivered before the teachers of Boston. Price 80 cents. Ginn & Co., publishers, Boston, Mass.

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School and Industrial Hygiene.—By Dr. C. H. Lincoln. Published by P. Blakiston, Son & Co., Philadelphia, Pa., at 50 cents.

Text Book of Hygiene.—By Dr. A. Wilson. Published at $1.00, by P. Blakiston, Son & Co., Philadelphia, Pa. This is one of the best works on hygiene now accessible to teachers. They will find it a store-house of knowledge on which to draw for plain talks on the school room.

School Hygiene.—Dr. A. Newsholme. D. C. Heath & Co., Boston. Price 50 cents.

The Sanitary Conditions and Necessities of School Houses and School Life.—D. F. Lincoln, M. D. Lomb Prize Essay.

School Hygiene.—Farquharson. Smith, Elder & Co., London, $2.75. (For private schools.)

School Buildings.—By E. C. Gardener. E. H. Kellogg & Co., New York city, publishers, $1.25.

Rural School Architecture.—Circular of Information No. 4, issued by the Commissioner of Education, Washington, D. C.

School Hygiene.—By W. J. Abel. Longman, Green & Co., publishers. $1.00.

School Hygiene No. 1, Addressed to Teachers.—Circular of Pennsylvania State Board of Health; to be had free, of the Secretary, in Philadelphia, Pa.

Sanitary Conditions for School Houses.—Circular of Information No. 3, 1891, of the U. S. Bureau of Education, Washington, D. C., 1891.

PRECAUTIONARY AND HYGIENIC CIRCULARS ISSUED BY THE STATE BOARD OF HEALTH OF PENNSYLVANIA.

No. 7. Precautions against cholera, cholera infantum, cholera morbus, summer diarrhœa and dysentery.

No. 8. Precautions against small-pox.

No. 18. Precautions against typhoid fever.

No. 19. Precautions against diphtheria.

No. 20. Contagious and infectious diseases.

No. 20. Contagious and infections diseases. (German.)

No. 21. Precautions against scarlet fever.

No. 22. Precautions against trichinosis.

No. 24. Recommendations in regard to the care of infants.

No. 25. The importance of caution and precision in the diagnosis of typhoid fever, with description of a cheap and convenient earth closet.

No. 26. School hygiene, addressed to teachers.

No. 28. Precautions against consumption.

No. 29. The dangers arising from public funerals of those who have died from contagious and infectious diseases. Addressed to the clerical profession.

No. 30. The disposal of the sewage of public edifices. Addressed to the trustees and managers of public institutions.

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No. 31. Precautions to be adopted by funeral directors to prevent the spread of contagious and infectious diseases.

No. 32. Precautions against sunstroke.

No. 33. School hygiene, No. 2. Addressed to school directors and trustees.

No. 34. First treatment of the apparently drowned.

No. 35. The prevention of blindness.

No. 36. Sanitary protective associations.

No. 37. Emergency hospitals.

No. 38. The care of the eye.

Any of the above circulars may be obtained on application to Dr. Benjamin Lee, Secretary of the State Board of Health, 1532 Pine street, Philadelphia, enclosing a two-cent postage stamp. The postage for the entire series, enclosed in a substantial box envelope, is four cents.

GEORGE G. GROFF, M. D.,
Chairman, Committee on School Hygiene.
BENJAMIN LEE, M. D.,
Secretary.

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APPENDIX G.

ANNUAL REPORTS OF CITIES AND TOWNS.

Carbondale.
Chester.
Johnstown.
Hazleton.
Lancaster.
Philadelphia.
Phœnixville.
Pittsburg.
Reading.
Scranton.
Shippensburg.
Titusville.

REPORT OF CITY OF CARBONDALE.

Annual report of the Secretary of the Board of Health of the city of Carbondale, Lackawanna county, made to the State Board of Health of Pennsylvania, for the year, beginning January 1, 1891, and ending December 31, 1891.

MEMBERS' NAMES.	Postoffice Address.
Samuel S. Imes, secretary,	Carbondale, Pa.
D. Leland Bailey, M. D., chairman,	"
Henry C. Wheeler, M. D., member,	"
John Copeland, member,	"
John F. Moffit, member,	"
L. I. Bunnell, member,	"

3. No improvements or changes made in city as regards water supply, drainage and sewerage, or in the methods employed in disposing of excreta?

4. Nuisances. In one instance where action was commenced to compel a property owner to comply with notice to connect his premises with the public sewer, the alderman before whom it was tried, said that the

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notice did not cover all the buildings on the premises and the board is now prosecuting the case in another court.

5. Communicable diseases:

NAME OF DISEASE.	No. of cases.	No. of deaths.	No. of outbreaks.	No. of houses infected.	No. of outbreaks confined to the first house.
Small-pox,	....	.....	.....	.....	.....
Diphtheria,	21	7	.....	7	7
Scarlet fever,	110	2	.....	.....	.....
Typhoid fever,	13	4	.....	13	

6. These diseases are reported to board by the physicians in attenance in accordance with the law ordinance or regulation requiring such report?

7. Action taken by board when cases of the communicable diseases have been reported to it? Signs are placed on the buildings and families are directed to observe the rules of the board.

8. All houses in which cases of small-pox, diphtheria and scarlet fever occurred are placarded.

9. Diseases more than usually prevalent during the year were measles and scarlet fever.

11. No contagious diseases entered any of the schools?

12. Lack of sewerage appears to be the cause of unhealthy localities.

13. What methods can you suggest for improving the sanitary condition of your city? More sewers.

14. No accidents.

16. No instance of food adulteration, or injurious effects from it.

17. No diseases of animals.

18. Were any by-laws adopted by your board in 1891? If so, please forward copies of all such to the office of the State Board. Will do so as soon as we have them printed.

19. Please give an account of any other work of interest which has been done by your board during the year. See letter.

21. What compensation or pay has been received by the secretary or health officer of your board, or by other members? If payment has not been received, for what reason? Secretary receives $200 per annum, sanitary policeman $600. Health officer is one of the members of the board and receives no compensation whatever. The total cost of maintaining the sanitary department during 1891 was $438, as the fees and fines made up the balance.

SAMUEL S. IMES,
Secretary Board of Health.

January 30, 1892.

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REPORT OF CITY OF CHESTER.

Annual report of the Secretary of the Board of Health of the city of Chester, Delaware county, made to the State Board of Health of Pennsylvania, for the year, beginning January 1, 1891, and ending December 31, 1891.

1. Name and address of each member.

NAME.	Postoffice Address.
Charles B. Ross, secretary,	623 Madison street.
George McCall, chairman,	213 East Fifth street.
Dr. C. W. Perkins, member,	403 East Ninth street.
Dr. Frank J. Evans, member,	216 West Fourth street.
Wm. D. Platt, member,	909 West Third street.
R. W. Blakeley, member,	Twenty-fourth and Chestnut sts.
John H. Mirkil, health officer,	Fifteenth and Chestnut streets.

2. Forty-four meetings have been held by the board during the year. New sewers built.

4. About 350 nuisances; removed 306.

5 Communicable diseases:

NAME OF DISEASE.	No. of cases.	No. of deaths.	No. of outbreaks.	No. of houses infected.	No. of outbreaks confined to the first house.
Small-pox.	.....	.....	.....	.....	.....
Diphtheria.	57	27	6 localities	45	2
Scarlet fever.	29	2	5 "	25	1
Typhoid fever.	20	16	7 "	20	1

6. They are not reported until after death; or until the patient, when a child, has recovered and wants a school permit.

7. In the event of death a watchman is placed on the premises on the day of burial and no public funeral is allowed.

8. Houses in which cases of small-pox, diphtheria and scarlet fever occurred were not placarded but fumigated.

9. Disease more than usually prevalent during the year, diphtheria, phthisis, marasmus.

11. Schools. Children are required to get a permit from this Board before entering school in case of contagious disease. They must have been well at least two weeks before the permit is granted.

12. Particularly unhealthy localities caused by bad drainage.

13. More sewers, better cesspools.

14. There were 18 accidental deaths from various causes.

16. No food adulteration.

17. No diseases of animals.

20. The present ones are good enough if properly enforced, as they no doubt are.

21. Compensation received by the secretary or health officer of your board, or by other members. The health officer is on duty all day and receives $60 per month. The secretary is obliged to spend two hours a

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day in his office and respond to the call of undertakers and school children at all times for $25 per month. Members of the board receive no pay.

February 3, 1892. CHARLES B. ROSS, *Secretary.*

REPORT OF CITY OF HAZLETON.

Enclosed please find copies of ordinance passed by city councils and approved by the mayor of the city of Hazleton, creating the board of health of the said city.

The following members nominated by the mayor and confirmed by select council, according to law:

First district, Charles R. Bernboy, five years.

Second district, J. B. Brown, one year.

Third district, Dr. R. B. Fruit, two years.

Fourth district, Dr. William R. McCombs, four years.

Fifth district, P. F. Boyle, three years.

The board met Monday evening, June 20, and organized by electing Dr. R. B. Fruit, president; James B. MacCartney, secretary; William E. Mumaw, health officer.

At a meeting of the board last evening (June 21) it was decided that the board through their secretary, invite Benjamin Lee, M. D., Secretary and Executive Officer of the State Board of Health to visit our city at his earliest convenience, with such information as will facilitate the completion of the organization and put the board in as perfect working shape as possible at the earliest practicable date.

The question arose on the adoption of rules and regulations which I submitted to them, having received them from you in July, 1890, when I attempted to organize a board of health under the old borough government.

The question of expense of your visit was also considered. The present financial condition of the city will not warrant the expenditure of any money other than is absolutely necessary. It was contended that as the State legislature had appropriated money for the traveling expenses, etc., of the State Board that you could visit us without incurring any expense to the local board. The board individually will make your visit as pleasant as possible, I can assure you.

Will you please send me copies of forms necessary, also a copy of compendium of the laws relating to the public health and safety, a copy of model ordinance and rules for each member of the board and send me anything pertaining to the organization of a board of health that you may have at your disposal. It is the intention of all the members of the board to have as complete and perfect a board of health in our mountain city as can be had.

Yours respectfully,

JAMES B. MACCARTNEY,

Secretary Board of Health, City of Hazleton.

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FILE OF SELECT AND COMMON COUNCILS, NO. 11.

Offered by THOMAS COBURN.

AN ORDINANCE CREATING A BOARD OF HEALTH.

Be it Ordained by the Select and Common Councils of the City of Hazleton.

SECTION 1 That a Board of Health in and for the City of Hazleton, be and the same is hereby created, to have, exercise and discharge the powers and duties given under Article XI of an act of assembly entitled "An act providing for the incorporation and government of cities of the third class," approved May 23, 1889, and such other acts of assembly of this Commonwealth as relate to the creation and managements of boards of officers.

SECTION 2. For the purpose of making appointments to membership of the said board, the city shall be divided into the following districts to-wit: The first district shall consist of the First and Third wards of the city; the Second district shall consist of the Second and Fourth wards of the city; the Third district shall consist of the Fifth and Sixth wards of the city; the Fourth district shall consist of the Seventh and Eighth wards of the city; and the Fifth District shall consist of the Ninth and Tenth wards of the city; and each of said districts shall have one member of the board.

SECTION 3. For the first term, to create the board, all appointments shall date from the first Monday in April, 1892, and the organization of the board shall be made as soon as practicable after their appointment.

SECTION 4. The secretary and health officer shall severally give bond in the sum of $2,000 each, conditioned as required by law.

SECTION 5. The secretary shall keep a registry of all fees received by the board, or any officer thereof, in the administration of the duties of their appointment, as also all penalties which shall be recovered for the violation of any regulation of the board, and the same shall be paid over monthly to the city treasurer.

Passed finally in common council this 3d day of June, A. D. 1892.

ELLIOTT P. KISNER,
President of Common Council.

Attest: C. H. LINDEMANN, *Clerk of Common Council.*

Passed finally in select council this 6th day of June, A. D. 1892.

H. C. MILLS,
President pro tem. of Select Council.

Attest: JAMES B. MACCARTNEY, *Clerk of Select Council.*

Examined and approved by me this 8th day of June, A. D. 1892.

N. L. GAVITT, *Mayor.*

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REPORT OF THE BOARD OF HEALTH OF JOHNSTOWN.

The total expenses of the board for the year have been $1,050.85 This includes salaries, printing and all incidental expenses of the board. The direct cash receipts were $5.70.

The total number of nuisances abated during the year was 789. These embrace a wide range of cases—defective sewerage, filthy houses, foul water-closets, dirty alleys, etc. For the five months of the first year's existence of the board, covered by our first report, the number of nuisances abated was 292. Our health officer reports that in almost every instance where he has called attention to the existence of nuisances, they have been promptly removed by the property owners, or those responsible, thus relieving the board of the necessity of legal proceedings and rendering its operations satisfactory to all concerned.

During the year there were reported to the board 248 cases of contagious diseases. The greatest number of cases were reported from the Sixteenth ward, where there is almost a total absence of sewerage, a matter to which the board has already called the attention of the councils. The efforts of the board toward preventing the spread of contagious diseases have been as vigorous and persistent as possible under the circumstances. It is proper to remark here that while in general the compliance of the citizens with the rules of the board concerning contagious diseases has been cheerful and prompt, there have been instances where the violation of the rules has amounted almost to defiance of them, and the board will feel called upon to vigorously rebuke any such violations in the future.

During the year 831 births were reported.

The marriages numbered 263 as reported by the persons officiating.

During the year there were 398 deaths. The death rate was greatest in the Fifteenth and Sixteenth wards, occasioned by defective sewerage, and by a pollution of the sources of domestic water supply, to which reference is made below.

The rate of deaths is about 13 per thousand, which compares favorably with cities much more advantageously situated.

On January 31, last, a case of cow-pox was reported to the board from a dairy near the city. The president of the board instructed the health officer to make an inspection, and after doing so he reported to the board as follows:

JOHNSTOWN, PA., *February 27, 1891.*

To the President and Members of the Board of Health:

GENTLEMEN: On January 31 a case of cow-pox was reported to the board and on order of the president an inspection was made. The case was on the farm of Griffith Bros., dairymen, about four miles from the

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city. I engaged the service of Dr. Prothero, a regularly graduated veterinary surgeon, and visited the farm on February 1. The disease was found to exist in three cows, which at that time were giving milk. I instructed the owner to have the diseased cows quarantined and treated by Dr. Prothero. Subsequently visits were paid by Dr. Prothero, myself and a member of the board, to twenty-one dairies furnishing milk in this city. While no additional cases of pox were discovered, many cows were found in poor condition, some being not properly stabled and others being sick. The owners were directed to properly care for their cows, and in case of sickness, to call a veterinary surgeon. This work occupied by parts of days, about a week. On a second visit to some of the dairies, great reforms were noticed over the condition existing at the first visit, hence it is believed that the work has accomplished much good.

Very Respectfully,

JAMES A. SLOAN,
Health Officer.

On February 16 the city was visited by a flood that covered a good portion of its territory, filling cellars, floating filth from outhouses and barns into the low lying sections of the city, over-flowing and clogging sewers, and in general creating a condition quite unfavorable to the health of the city. The board, as soon as the flood had subsided, set to work cleaning cellars and streets and distributing disinfectants wherever needed.

On July 15 a number of cases of typhoid and malaria fever were reported from the Fifteenth and Sixteenth wards. During the latter part of this month the number of cases was over one hundred. The board promptly made a thorough investigation of the districts and did everything to abate the diseases. Finally samples of the water in the St. Clair and Cambria and Morrellville reservoirs were obtained and forwarded to Dr. Benjamin Lee, of the State Board of Health, for analysis. A sample of the Millcreek water was also sent. A return was received on September 16. The report stated that the water taken from the Cambria and Morrellville reservoir contained bacilli resembling those of typhoid fever and that the water was decidedly suspicious as to its healthfulness. On September 17 the health officer inspected the stream supplying water to this reservoir and discovered there had been a case of typhoid fever on the farm of Jackson Horner since about July 1. The farm is situated about a mile and half above the reservoir and appeared to be clean and neatly kept, with the exception of a cesspool standing near a small stream tributary to the reservoir. It was learned that the stool of the fever patient above referred to had been emptied into this cesspool, the people on the farm little thinking of the contagious elements which they were sending down to their neighbors in the city. Arrangement, were made and on the 21st of September the contents of the

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cesspool were removed to the woods and burned. The location of the cesspool was also changed to a more appropriate place, and the reservoir was drained and cleaned on the following day. The fever at once began to abate and it was shown beyond doubt that the nuisance mentioned was the cause of the sickness in the Fifteenth and Sixteenth wards. Five deaths resulted from this cause. The report of the St. Clair water showed the presence of diatoms, spores, vegetable matter and micrococci, as well as bacilli, probably from manure. Chemically considered, this water was in "fair" condition for household use. On September 19 an inspection was made of the stream which supplies the St. Clair reservoir. Several manure heaps were found along the roadside close to the stream. Rain had been washing the manure into the reservoir causing the water to become more or less polluted. The owners of the same were notified to remove the manure heaps, which was promptly done, and the water company was informed of the condition of the reservoir. They at once had it thoroughly cleaned. The microscopic examination of the Millcreek water showed the presence of zoologea, cladothryx and spores. Chemically considered this water was in "good" condition for household use. On September 18 an inspection of the Millcreek reservoir was made. The water was all drained off and men were engaged cleaning it. This reservoir seemed to be in good condition.

The water supply of the city is now thought to be as pure as that of any town in the country, but frequent inspection will be necessary to maintain it in this condition.

The question of the best manner of disposing of the city's garbage engaged the attention of the board during the year.

Plans were procured for a furnace in which to burn the garbage, and an estimate of the cost of a suitable one was obtained. The board had sufficient funds on hand to construct the furnace, but so far has been unable to secure a proper location. Should councils find themselves in a position to aid the board in this matter, they will be conferring a great benefit upon the public.

In conclusion, the board congratulates the councils and the citizens upon the steadily improving sanitary condition of the city, and urges councils to, as speedily as possible, take action upon the recommendations of the board heretofore made for sewers in various districts, which are regarded as essential to the health of the people.

Annual report of the health officer of the board of health of the city of Johnstown, Pa., made to the State Board of Health of Pennsylvania, for the year, beginning January 1, 1891, and ending December 31, 1891:

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MEMBER'S NAME.	Postoffice Address.
George J. Akers, secretary,	Johnstown, Pa.
Dr. A. N. Wakefield, chairman,	"
Dr. F. Schill, member,	"
John J. Pfarr, member,	"
Lackey Kelley, member,	"
James A. Sloan, health officer,	"

2. Twelve meetings have been held by the board during the year.

3. Some improvements have been made in city as regards water supply, drainage and sewerage, or in the methods employed in disposing of excreta.

4. Nuisances. Reported to board, 941; removed, 789.

5. Communicable diseases:

NAME OF DISEASE.	No. of cases.	No of deaths.	No. of outbreaks.	No. of houses infected.	No of outbreaks confined to the first house.
Small-pox.	.....	.....	.....	.....	.....
Diphtheria.	20	7	20	10	.....
Scarlet fever.	89	9	89	59	.....
Typhoid fever.	51	11	51	39	.....

6. These diseases are reported to board by the physicians in attendance in accordance with the law ordinance or regulation requiring such reports.

7. Action taken by board when cases of the communicable diseases have been reported to it. The health officer inspects the premises and notifies the superintendent of schools to dismiss children.

8. The houses in which cases of small-pox, diphtheria and scarlet fever occurred were placarded.

9. Diseases more than usually prevalent during the year; scarlet fever and measles.

10. For facts regarding any cases of disease which were interesting from a sanitary point of view, see report enclosed.

11. No contagious disease entered schools.

12. No particularly unhealthy localities.

13. Methods for improving the sanitary condition. See report.

14. No accidents.

15. For facts regarding cases of diseases which appeared to have been caused by polluted water cess-pool or sewer-gas, defective ventilation, lead, arsenical, or other forms of poisoning, see report.

16. No food adulteration, or injurious effects from it.

17. Diseases of animals. See report.

18. No by-laws adopted by board in 1891.

19. No other work of interest. See report.

20. No changes which ought to be made in the health laws of the State.

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21. Compensation received by the secretary or health officer of board, or by other members. Health officer receives $60.00 per month, secretary receives $16.66 per month.

JAMES A. SLOAN,
Health Officer.

February 12, 1892.

REPORT OF THE CITY OF LANCASTER.

Annual report of the secretary of the Board of Health of the city of Lancaster, Pa., made to the State Board of Health of Pennsylvania, for the year, beginning January 1, 1891, and ending December 31, 1892.

1. Name and address of each member:

NAME.	Postoffice Address.
Jacob Halbach, secretary,	No. 32 North Duke.
Hon. W. A. Morton, chairman,	South Queen.
R. M. Bolenins, M. D., member,	48 South Queen.
D. R. McCormick, M. D., member,	226 West King.
S. H. Zahm, Esq., member,	20 South Queen.
M. F. Stergerwalt, Esq., member,	140 East King.
Walter Boardman, M. D., health officer,	38 South Queen.

2. Twenty-one meetings have been held by the board during the year.

3. No improvements or changes made as regards water supply, drainage and sewerage, or in the methods employed in disposing of excreta.

4. Nuisances. Reported, 47; removed all with one exception, an open sewer at the corner of Chestnut and Ann streets, belonging to the city. Our Board has made repeated efforts to have this sewer continued to a living stream but councils have refused to build the same.

5. Communicable diseases:

NAME OF DISEASE.	No. of cases.	No. of deaths.	No. of outbreaks.	No. of houses infected.	No. of outbreaks confined to the first house.
Small-pox.	.....	.....	.....	.....	.....
Diphtheria.	283	52	.....	.....	.....
Scarlet fever.	28	6	.....	.....	.....
Typhoid fever.	33	9	.....	.....	.....

6. These diseases are reported to the board by the physicians in attendance in accordance with the law ordinance or regulation requiring such reports.

7. Action taken by board when cases of the communicable diseases

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have been reported to it. Action to prevent children from attending school and the health commissioners instructed to see that the proper precautions are taken to prevent the spread of disease.

8. Houses in which cases of small pox occurred only were placarded.

9. Diseases more than usually prevalent during the day. Diphtheria.

11. The chairman of hygiene committee of school board has been notified by the secretary of this board, daily, of all contagious diseases reported to him and where located and looks to it that none of the children of infected families attend.

12. No particularly unhealthy localities.

13. Abated nuisance at Ann and Chestnut streets.

14. No accidents.

16. No instances of food adulteration, or injurious effects from it.

17. No diseases of animals.

21. Compensation received by the secretary or health officer of the board, or by other members. The secretary receives $100 per annum. health commissioner, $200 per annum.

JACOB HALBACH,
Secretary.

February 8, 1892.

EXTRACTS FROM THE ANNUAL REPORT OF THE BOARD OF HEALTH OF PHILADELPHIA FOR 1891.

Prepared by WM. B. ATKINSON, A. M., M. D.

The death rate for the year was 21.85 per thousand, an excess over the previous year of 1.10. A larger number of cases of contagious diseases was treated at the Municipal Hospital than for several years.

The number of deaths was twenty-three thousand, three hundred and sixty-seven (23,367), an increase of one thousand six hundred and thirty-five (1,635). The rate was equivalent to one death to every 45.75 persons.

The number of births was twenty-nine thousand seven hundred and sixty-four, an increase of one thousand nine hundred and six (1,906).

The marriages were eight thousand one hundred and thirty (8,130), an increase of nine hundred and thirty-four (934).

The population of the city is estimated at one million sixty-nine thousand two hundred and sixty-four (1,069,264). This gives a death rate as above, a birth rate of 26.85 per thousand and a marriage rate of 15.20 per thousand.

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The following table shows the ratio of deaths, with population, for the past thirty-one years:

	Population.	Deaths.	Deaths to 1,000 persons living.	Persons living to one death.
1861,	576,408	13,540	23.49	42.57
1862,	587,287	13,864	23.60	42.36
1863,	598,166	14,220	23.73	42.06
1864,	608,045	15,875	26.10	38.30
1865,	618,924	15,633	25.25	39.59
1866,	620,808	15,362	22.80	40.99
1867,	640,682	12,660	19.76	50.60
1868,	651,561	13,391	20.39	48.65
1869,	662,440	13,428	20.27	49.33
1870,	*674,022	15,317	22.72	44.00
1871,	700,000	15,485	22.12	45.20
1872,	725,000	18,987	26.19	38.18
1873,	750,000	15,224	20.29	49.26
1874,	775,000	15,238	19.66	50.86
1875,	800,000	17,805	22.25	44.93
1876,	825,594	18,892	22.88	43.69
1877,	850,856	16,004	18.81	53.16
1878,	876,118	15,743	17.97	55.65
1879,	901,380	15,473	17.17	58.25
1880,	*846,980	17,711	20.91	47.82
1881,	868,000	19,515	22.48	44.47
1882,	886,539	20,059	22.62	44.19
1883,	907,041	20,076	22.13	45.18
1884,	927,995	19,999	21.55	46.40
1885,	949,432	21,392	22.53	44.38
1886,	971,363	20,005	20.59	48.55
1887,	993,801	21,719	21.85	45.75
1888,	1,016,758	20,372	20.04	49.90
1889,	1,040,245	20,536	19.74	50.65
1890,	*1,046,964	21,732	20.76	48.18
1891,	1,069,264	23,367	21.85	45.75

* U. S. census—the intervening years population estimated.

BIRTHS.

The number of births reported during the year amounts to twenty-nine thousand seven hundred and sixty-four (29,764), an increase of one thousand and nine hundred and six (1,906) over the previous year.

Of these, fifteen thousand five hunded and fifty-seven (15, 557) were males, and fourteen thousand two hundred and seven (14,207) were females.

The number of illegitimate births amounted to seven hundred and thirty-three (733.)

The number of twins amounted to three hundred and twenty-four (324).

The number of triplets amounted to two (2).

The following table gives the number of births in each month, white and colored, also the still births, twins and triplets, 1891:

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Table I.—Births.

1891.	Total.	Births.		Black.		Still Born.		Twins.	Triplets.	Illegitimate.
		M.	F.	M.	F.	M.	F.			
January,	2,688	1,344	1,294	43	61	78	51	30	1	71
February,	2,448	1,300	1,148	41	23	66	41	21	. .	60
March,	2,479	1,259	1,220	52	31	42	41	26	. .	67
April,	2,166	1,149	1,017	32	25	64	49	34	. .	61
May,	2,246	1,144	1,102	35	36	39	36	28	. .	78
June,	2,348	1,249	1,099	43	37	47	28	22	. .	61
July,	2,657	1,345	1,312	32	37	72	40	32	1	56
August,	2,761	1,416	1,345	36	36	43	34	29	. .	69
September,	2,570	1,362	1,208	38	40	60	28	24	. .	43
October,	2,504	1,357	1,147	39	20	84	47	28	. .	40
November,	2,364	1,248	1,116	32	30	66	37	23	. .	61
December,	2,583	1,384	1,199	24	26	71	53	27	. .	66
Total,	29,764	15,557	14,207	447	402	732	485	324	2	733

The following table gives the nativity of the parties married:

Marriages—Nativities of the Parties.

Nativity.		Birthplace of Brides.			Total of grooms.
		United States.	Foreign.	Not given.	
Birthplace of grooms.	United States,	4,257	486	35	4,778
	Foreign,	771	2,279	16	3,066
	Not given,	30	4	252	286
	Total of brides,	5,058	2,769	303	8,130

The number of marriages in which both parties were natives of the United States was four thousand two hundred and fifty-seven (4,257); the number of marriages wherein both parties were foreign born amounted to two thousand two hundred and seventy-nine (2,279).

The number of native grooms amounted to four thousand seven hundred and seventy-eight (4,778); native brides, five thousand and fifty-eight (5,058); of foreign grooms, three thousand and sixty-six (3,066); and foreign brides, two thousand seven hundred and sixty-nine (2,769).

The following table shows the ages of the parties married during the year 1891:

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Marriages—Age of the Parties.

1891.		Ages of the Women.									Total of men.
		Under 20.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Not given.	
Ages of the Men.	Under 20,	44	5	. . . .	. . .	. . .	. . .	. . .	. . .	. . .	49
	20 to 25, .	456	1,750	222	30	. . .	. . .	. . .	. . .	23	2,481
	25 to 30, .	240	1,572	924	133	7	. . .	. . .	. . .	15	2,891
	30 to 40, .	61	467	712	431	33	. . .	. . .	. . .	12	1,716
	40 to 50, .	2	34	65	187	71	6	1	. . .	6	372
	50 to 60, .	1	5	7	56	62	21	2	. . .	5	159
	60 to 70, .	. . .	. . . .	2	9	19	15	2	. . .	. . .	47
	70 to 80, .	. . .	1	. . . .	. . .	2	2	1	. . .	1	7
	80 to 90, .	. . .	1	. . . .	. . .	. . .	. . .	. . .	. . .	.	1
	Not given,	3	10	6	2	. . .	. . .	. . .	. . .	386	407
Total of women,		807	3,845	1,938	848	194	44	6	. . .	448	8,130

The number of men married under twenty years of age was forty-nine (49); the number of women was eight hundred and seven (807). Between seventy and eighty years seven (7) men and no women were married, and one man over eighty years.

MORTALITY.

White,	22,404
Black,	963
The total number of deaths during the year,	23,367
Males,	11,887
Females,	11,480
Total,	23,367
Adults, male,	6,317
Adults, female,	6,611
Total adults,	12,928
Minors, male,	5,570
Minors, female,	4,869
Total minors,	10,439
Deaths from specific disease,	22,000
Old age,	805
Violence (accident),	430
Homicide, suicide,	130
Unknown causes,	2
Total,	23,367

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In the above figures, the still-born, premature births and bodies brought to the city for interment, are not included.

The mortality of adults amounted to twelve thousand nine hundred and twenty-eight (12,928), an increase of six hundred and seventy-one (671) over the previous year; the mortality of minors amounted to ten thousand four hundred and thirty-nine (10,439), an increase of nine hundred and sixty-four (964) over the previous year.

The number of natives born amounted to seventeen thousand five hundred and seventy (17,570); of foreign born to five thousand two hundred and forty-one (5,241), and of persons whose nationality was not given, to five hundred and fifty-six (556).

Abscess.—The number of deaths attributed to this cause amounted to one hundred and sixteen (116).

Cancer.—The deaths from cancer amounted to five hundred and seventy-two (572).

Cerebro-Spinal Meningitis.—There were twenty-six (26) deaths from this cause.

Consumption of Lungs.—There were two thousand six hundred and thirty-six (2,636) deaths from this cause during the year, a decrease of one hundred and twenty-eight (128) from the previous year; the deaths from this cause in each month of the year were as follows:

January,	286
February,	191
March,	228
April,	248
May,	219
June,	175
July,	216
August,	173
September,	151
October,	261
November,	204
December,	284

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The number of deaths from consumption, of both sexes, for the past thirty-one years were as follows:

YEARS.	Males.	Females.	Total.
1861,	910	907	1,817
1862,	961	988	1,949
1863,	966	989	1,955
1864,	1,087	1,002	1,289
1865,	1,020	1,006	2,026
1866,	994	950	1,944
1867,	942	1,005	1,947
1868,	1,000	995	1,995
1869,	982	993	1,975
1870,	1,118	1,190	2,308
1871,	1,099	1,138	2,337
1872,	1,167	1,163	2,330
1873,	1,093	1,198	2,291
1874,	1,133	1,171	2,304
1875,	1,185	1,174	2,359
1876,	1,288	1,388	2,676
1877,	1,142	1,207	2,349
1878,	1,154	1,337	2,491
1879,	1,233	1,248	2,481
1880,	1,325	1,367	2,692
1881,	1,358	1,410	2,768
1882,	1,382	1,427	2,809
1883,	1,343	1,455	2,798
1884,	1,395	1,406	2,801
1885,	1,346	1,475	2,821
1886,	1,468	1,366	2,834
1887,	1,437	1,363	2,800
1888,	1,404	1,291	2,695
1889,	1,297	1,235	2,532
1890,	1,457	1,307	2,764
1891,	1,380	1,256	2,636

Cholera Infantum.—The number of deaths was one thousand two hundred and eleven (1,211), an increase of two hundred and ninety-three (293).

Diphtheria.—The number of deaths was nine hundred and eighteen (918), an increase of three hundred and ninety (390).

Scarlet Fever.—Deaths three hundred and forty-one (341), an increase of one hundred and fifty-two (152).

Typhoid Fever.—Deaths six hundred and eighty-three (683), an increase of seventeen (17).

Hydrophobia.—Deaths two (2), about the usual yearly number.

Inflammation of the Lungs.—Deaths two thousand one hundred and eleven (2,111), an increase of ninety-six (96).

Influenza.—Deaths three hundred and eight (308), an increase of one hundred and sixty-one (161).

Old Age.—Deaths eight hundred and five (805), a decrease of twelve (12).

Small-pox.—Deaths were five.

Whooping-cough.—Deaths one hundred and forty-nine (149), a decrease of fifty-six (56).

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REPORT OF BOROUGH OF PHŒNIXVILLE.

Annual report of the secretary of the board of health of the borough of Phœnixville, Pa., made to the State Board of Health of Pennsylvania, for the year beginning January 1, 1891, and ending December 31, 1891.

1. Name and address of members:

NAME.	Postoffice Address.
I. E. Miller, secretary,	Phœnixville, Pa.
Amory Coffin, chairman,	"
Moritz G. Lippert, member,	"
Henry McGuckian, member,	"
John O. K. Robarts, member,	"
Samuel J. Rowland, member,	"
Samuel Fitzgerald, member,	"
Jos. A. Pennypacker, member,	"
Jonathan Billig, member,	"
John Murphy, member,	"
J. G. Shoemaker, M. D., health officer,	"

2. Thirteen meetings since organization of board, May 25, 1891.

4. Nuisances. Reported, 25; removed, 25.

5. Communicable diseases:

NAME OF DISEASE.	No. of cases.	No. of deaths.	No. of outbreaks.	No. of houses infected.	No. of outbreaks confined to the first house.
Small-pox.					
Diphtheria,	4		1	3	1
Scarlet fever,	44	2	1	34	1
Typhoid fever,	1		1	1	1 brought to Phœnixville from the south, fully developed.

6. Diseases are reported to board by the physicians in attendance in accordance with the law ordinance or regulation requiring such reports, very promptly.

7. They are referred to health officer for investigation, and, if necessary, for proper action.

8. Houses in which cases of small-pox, diphtheria and scarlet fever occurred, are not placarded.

9. Diseases more than usually prevalent during the year, measles, scarlatina, la grippe, pneumonia.

10. Cases of disease which were interesting from a sanitary point of view: Marked depression with la grippe followed in a very large per cent. of cases by pneumonia; we estimate about 2,000 cases of la grippe with less than 10,000 inhabitants.

11. Schools. No special cases in which unhealthy conditions existed. Secretary promptly notifies principal of schools of cases of contagious disease in families having children attending school, and principals are required to prohibit such pupils from attending until they bring a certificate from the attending physician, that danger no longer exists.

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12. Particularly unhealthy localities.

13. Suggest for improving the sanitary condition of borough, a complete system of underground drainage or sewerage.

14. Accidents. One death from drowning; one death from railroad accident.

16. No food adulteration.

17. No disease of animals.

18. By-laws adopted by board in 1891. Ordinances were passed by borough council establishing board of health and rules and regulations for the same.

19. Nothing of any special importance.

21. Compensation received by the secretary or health officer of board, or by other members. No payment has been received or claimed by secretary, health officer or other members of the board, as all are willing to give their services without compensation.

I. E. MILLER,
Secretary.

February 13, 1892.

REPORT OF THE BOARD OF HEALTH OF THE CITY OF READING FOR 1891.

Members. M. A. Rhoads, M. D., president; Martin Luther, M. D., Wm. F. Marks, M. D., D. P. Schlott, Thomas P. Merritt, A. B. Dundor, M. D., C. H. Schaeffer, Esq., E. A. Howett, secretary; R. J. Laing, health commissioner.

In the month of October typhoid fever was reported.

The committee on epidemics investigated the cause of the outbreak, and found the cellars of the dwellings damp, and several containing water; the privies foul, full and overflowing; several discharging their contents into a ten-foot alley in the rear, an alley already filthy with refuse and garbage.

On further investigation the committee also ascertained that the people living in that section were supplied with water from the Philadelphia and Reading Railroad Company's reservoir on North Sixth street west of the Philadelphia and Reading railroad, the houses in question being owned by the company. The committee found that this water supply received all the drainage from a large area embracing that of the new brewing company, the buildings of the Berks County Agricultural Society, and all that portion of ground southward as far as the horse stables of the Reading City Passenger railway, together with that of the rolling mill and the houses in the vicinity. This vast amount of drainage empties into a creek south of the Alsace church hill and is

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collected in a dam east of the East Pennsylvania railroad from whence it passes through a large pipe into a second dam or reservoir situated between the East Pennsylvania railroad and the Philadelphia and Reading railroad, from whence it is pumped into the main reservoir west of North Sixth street and distributed to the houses owned by the Philadelphia and Reading Railroad Company.

The above facts being made known, and the water found to be utterly unfit for domestic use, this department communicated with the Philadelphia and Reading authorities, setting forth the facts as above related, and requested immediate action. The company responded promptly, and at the suggestion of the Board of Health discontinued using the reservoir water for their tenants, and had their hydrants attached to the city mains.

In a short time all trouble ceased, and there has not been any further outbreak.

During the year there were reported two hundred and forty-one cases of scarlet fever, twenty cases of diphtheria, and eighty-three cases of typhoid fever.

Of scarlet fever, eleven died.

Of the twenty cases of diphtheria, ten died, showing a greater mortality by far than scarlet fever.

Eighty-three cases of typhoid fever were reported.

Too much care cannot be exercised in the disposal of the fœcal discharges from typhoid fever patients. The discharges in a fresh condition are not active, but must undergo developments outside of the body. No fecal matter, therefore, from a typhoid fever patient should ever be thrown into privy or cesspool. Decomposition will liberate gases which will carry the typhoid poison and fill the air we breathe, or finds its way into our drinking water from springs and wells which have become contaminated by matter from adjoining privies and cesspools.

The future of sanitary science is to us full of hope. While there are many who believe in non-interference in the self-limited diseases, *we* firmly believe that contagious diseases will some day be blotted out, that epidemics of all kinds will be thoroughly understood, and completely under government, in fact that there will be no more epidemics excepting on the confines of civilization, bounds which they will never pass.

We present as an appendix to this report a very valuable brochure, accompanied by voluminous statistical tables, the excellent and efficient work of a fellow member of this board.

Three suits for violation of the rules of the board were instituted, in all of which judgment was obtained against the defendants.

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MARRIAGES—793.

Seven hundred and ninety-three marriages were solemnized during the year 1891, an increase of forty-five as compared with the year 1890.

The ages of the contracting parties were:

Under 20— 39 men and 227 women.
20 to 25—418 men and 405 women.
25 to 30—178 men and 80 women.
30 to 40—105 men and 48 women.
40 to 50— 25 men and 20 women.
50 to 60— 15 men and 5 women.
60 to 70— 3 men and — ——
70 to 80— 3 men and 1 woman.
Age not given—7 men and 7 woman.

Table Showing the Ages of the Parties at the Time of Marriage.

Ages of Grooms.	Ages of Brides.									
	Under 20 Years.	20 to 25.	25 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	Not given.	Total Men.
Under 20 years,	32	7	.	. .	. .	. .	. .	. .	. .	39
20 to 25 years,	157	240	21	. .	. .	. .	. .	. .	. .	418
25 to 30 years,	28	114	29	6	1	. .	. .	. .	. .	178
30 to 40 years,	10	42	25	27	1	. .	. .	. .	. .	105
40 to 50 years,	. . .	2	4	11	7	1	. .	. .	. .	25
50 to 60 years,	. .	. . .	1	2	9	3	. .	.	. .	15
60 to 70 years,	. . .	. . .	. .	1	2	. .	. .	. .	. .	3
70 to 80 years,	. . .	. . .	. .	1	.	1	. .	1	. .	3
Not given,	. . .	. . .	. .	. .	. .	. .	.	. .	7	7
Total women,	227	405	80	48	20	5	. .	1	7	793

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Nationality of Grooms and Brides.

	Quarter ending March 31, 1891.		Quarter ending June 30, 1891.		Quarter ending Sept. 30, 1891.		Quarter ending Dec. 31, 1891.		Total.	
	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.	Grooms.	Brides.
City,	49	53	52	59	55	50	60	77	216	237
County,	88	86	86	84	65	85	91	99	330	354
State,	24	26	34	36	40	30	44	28	142	120
United States,	6	5	11	5	9	9	17	13	43	32
Foreign,	15	11	13	13	13	9	12	9	53	42
Not given,	2	3	3	2	1	. . .	3	3	9	8
	184	184	199	199	183	183	227	227	793	793

BIRTHS—1,792.

Seventeen hundred and ninety-two births were reported during the year, an increase of 149 as compared with the year 1890. Nine hundred and twenty-seven were males, 863 were females, and in two the sex was not given. Eleven were colored, four males and seven females.

During the month of January there were 161 births; February, 151; March, 176; April, 147; May, 114; June, 143; July, 141; August, 165; September, 164; October, 140; November, 164; December, 152.

The excess of births over deaths was 730.

The birth rate was 29.7 in 1,000 for the year in 1891, and the death rate 17 6.

DEATHS—1,062.

Permits were issued by the department of health for the burial of 1,304 during the year 1891. Of this number 116 were brought here from other places, 85 were still-born and 41 were premature births, leaving a net total for the city of 1,062 deaths.

Four hundred and six were married, 521 were single, 134 widows and one in which the social condition was unknown.

Five hundred and thirty-nine were males, 523 were females. Of the still-born children 56 were males and 29 were females. Of the premaature births 18 were males and 23 females.

Of the decedents 962 were born in the United States, 90 were of foreign birth and of 10 the nativity was unknown

Two hundred and seventy-four died under the age of one year, 66 prior to the second year, 74 before reaching the fifth year, 46 between the ages of five and ten; 146 between the ages of ten and thirty, 210 between thirty and sixty, 197 between the ages of sixty and eighty, 42 between eighty and ninety, four between ninety and a hundred, and in three the ages could not be ascertained.

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One hundred and ninety-eight belong to the class zymotic, 162 to the constitutional, 580 to the local, 73 to the developmental, 48 were the result of violence, and in one case the cause of death was not mentioned.

Adding together the number of deaths under ten years, we have 460, or 43.37 per cent. of all deaths.

The average number of deaths per month was 108.66 an increase of 15.62 per cent., as compared with the year 1890. The least number of deaths in any one month was, 70 in May. The greatest number, 131 in July.

The average number of deaths per week was 20.42. The greatest number reported in any one week, was the week ending August 10, when there were 47 deaths, and the least number for the week ending July 6, when there were 11 deaths.

One hundred and twenty-six permits were issued for the burial of premature births and still-born children. These are omitted from the general summary as not properly belonging to the city's death rate.

The estimated population of the city of Reading is 60,250 (census of 1890, 58,661); the annual ratio of deaths per 1,000 inhabitants is 17.06.

Year.	*Population.*	*Total deaths.*	*Death rate.*
1891,	60,250,	1,062,	17.06.

The nationality of the decedents was as follows:

United States,	955	Belgium,	1
Germany,	56	Poland,	2
Ireland,	20	Hungary,	1
England,	9	Sweden,	1
Scotland,	1	France,	1
Prussia,	2	Canada,	1
Denmark,	1	Switzerland,	2
"Europe,"	2	Unknown,	7

Table Showing the Ages of Decedents for 1891. Premature and Still-born Children not included.

	Under 1 year.	1 to 2.	2 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Not given.	
Deaths,	286	68	78	47	20	41	96	85	76	87	111	124	49	4	5	...
Brought from a distance,	13	2	4	1	2	5	12	15	10	10	17	16	6		3	...
Net deaths in city,	273	66	74	46	18	36	84	70	66	77	94	109	43	4	2	1,062

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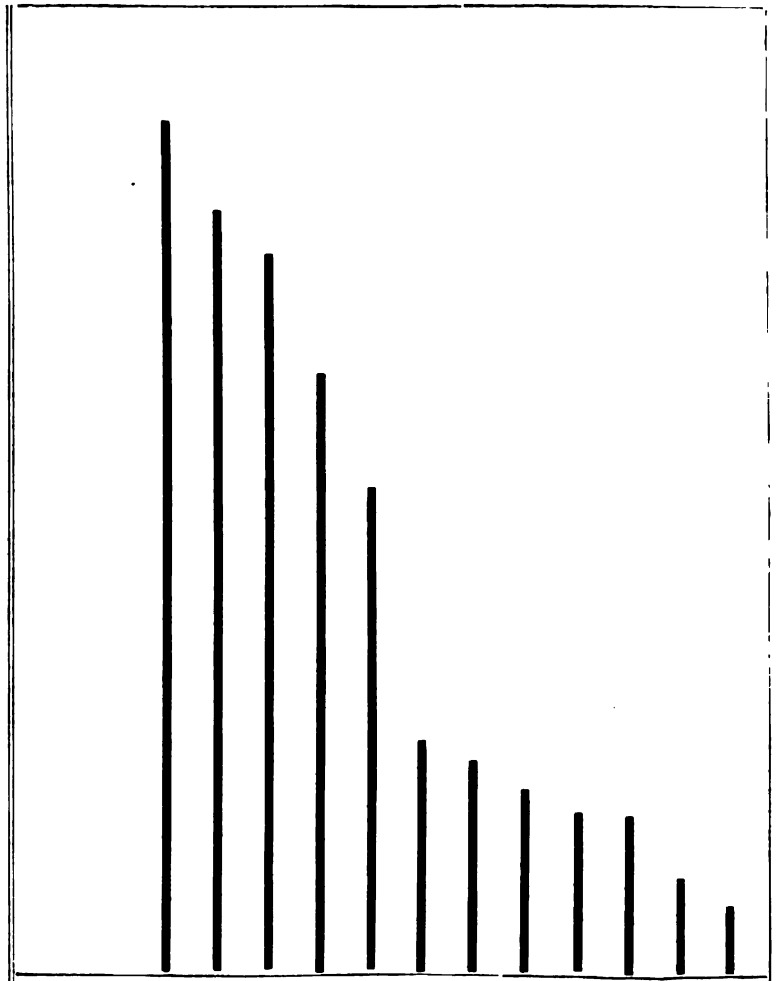
Diagram Showing the Comparative Mortality by Absolute Numbers of Decedents from twelve Prominent Causes of Death during 1891, in Reading, Pa.



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A RECAPITULATION OF SOME OF THE MOST PROMINENT DISEASES.

Infantile Diarrhœa.—Classed as having died from infantile diarrhœa are all cases whose deaths have been certified to as having occurred from "summer complaint," "cholera infantum," "diarrhœa," "dysentery," "entero-colitis," etc., and whose ages did not exceed two years, 122.

Pulmonary Consumption.—Consumption of the lungs stands well up on the list with 103 deaths. This disease prevailed most during the months of January and April. Forty-five were males and fifty-eight females. Five died before reaching their fifteenth year, thirty-six between fifteen and thirty, forty-three between thirty and fifty, thirteen between fifty and seventy, five between seventy and ninety, and one in which the age is not given.

Pneumonia.—Fifty-five males and forty females, forty-six were adults and forty-nine minors.

Typhoid Fever.—Twenty-nine. The greatest number of deaths was in the months of October and November.

Scarlet Fever.—Eleven.

Croop.—Thirty.

Diphtheria.—Ten.

A GENERAL SUMMARY.

		Percentage of total Mortality.
Zymotic diseases, ...	198	18.6
Constitutional diseases, ...	162	15.2
Local diseases, ...	580	54.6
Developmental diseases, ...	73	6.8
Deaths from violence, ...	48	4.5

In looking over the list of deaths we find a very large infant mortality. Taking the number of deaths during 1891, we find an infant mortality, those dying before having reached their fifth year, that is surprisingly large. *Four hundred and thirteen children;* over 38 per cent. of all deaths. One hundred and twenty-four deaths in July, and of this number seventy were under five years of age. There is no doubt but that this large infant mortality exists principally among the poorer of the inhabitants and is largely due to the gross infractions against the simplest and most generally recognized laws of infantile hygiene, viz: pure air, good food and cleanliness. And since we know the origin, and believe the causes to be practically removable, it seems it ought to be possible to effect a greater reduction in the rates of mortality among infants. Ignorance and poverty are the factors that are largely responsible for this condition of things, and as such agencies are not amenable to sanitary measures, improvement here can only be looked for from educational influences, which tend to elevate the mental and moral condition, and inculcate in parents a proper sense of responsibility to their offspring.

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It is somewhat remarkable that the public is so slow to appreciate the importance of sanitary science. The mass of people in their conservatism hinder in many ways the work of the true reformer. Sanitarians the world over believe that the zymotic diseases are altogether preventable, and that variations in the prevalence of those diseases, before and after certain sanitary improvements have been introduced, show that we already possess sufficient knowledge to control their diffusion to some extent, and even to prevent in some cases their development.

If we ever hope to reap the beneficial results expected from strict attention to sanitation, we must rely upon the philanthropic exertions of charitable institutions. We must pay strict attention to all the details, and call upon charitable people everywhere to assist parents to understand and carry out the approved rules governing infant hygiene.

M. A. RHOADS, M. D.,
President.

Reading, Pa., February 8, 1892.

Report of A. B. Dundor, M. D.

MEMBER OF THE COMMITTEE OF PREVENTABLE DISEASES AND SCHOOL HYGIENE.

To the President and Members of the Board of Health of the City of Reading:

GENTLEMEN: I herewith present you a statistical report of the hygienic condition of the public schools of the city of Reading.

Hygiene is not of modern origin. The ancient Greeks and Romans worshipped at the shrine of Hygeia, the goddess of health, who was the daughter of Æsculapius, the god of the healing art, and had her temples side by side with those of Apollo, the god of archery, prophecy and music, and those of Minerva, the goddess of the liberal arts and sciences.

But, in no epoch of the world's history was there more homage paid to hygiene than that of the present. The study of the laws of health with its application to the prevention of diseases now finds its most earnest devotees among the best scientists of civilized nations.

To prevent is seemingly now becoming paramount to that of healing or curing disease.

The individual, the public, the nation, all alike, are interested in this subject; and in proportion to the proper observance and promotion of its teachings will they all be happy and prosperous.

We are not presumed to treat of hygiene in all its applications.

We are concerned only in its application to our public schools, and will more particularly consider the subject in this relation.

Having made a pretty exhaustive examination of our public schools and secured quite an extensive history of the buildings, furniture and pupils, we will endeavor to the best of our ability to discuss school hygiene in its application to the public schools of our city.

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If we succeed, through our board of health, in awakening sufficient interest among those having supervision, to make sincere efforts to remedy the most serious defects existing in our schools, we will feel that our time and labor spent have not been in vain.

As upon each succeeding generation depends the future destiny of our country, it is a matter of vital importance whether our children emerge into manhood or womanhood with healthy bodies and the normal functions of all their organs unimpaired, or, whether they leave our schools with deformed bodies, wrecked constitutions and blunted intellects, to enter upon the duties of life and work out the destined problem set before each one. In this age of bacteriology and preventative measures, there is no place like the public schools of our country that presents so vast a field to affect for good or evil in proportion as the sanitary conditions are observed and enforced.

Here is the very place where the whole machinery of sanitary science should be put in motion.

Site.

The site of school houses should be on elevated ground, free from dampness, dust and smoke, and in as quiet places as possible; away from noisy railroads, manufactories and other noisy places, such as engine houses, markets, stables, etc.

They should have plenty of vacant ground between them and other buildings, and free from large shade trees, so as to afford ample and pleasant play-grounds and permit a free entrance of sunlight into every room.

In a general way our school houses are pretty free from any serious obstructions by the close proximity of other buildings or large shade trees, or subject to disagreeable noises.

The following are the most seriously affected: The Ninth and Spruce street school is very much annoyed by the noise of the electric railway; Franklin and Peach by the Friendship fire engine house and its stable, particularly when they load manure, the teachers inform us that they are annoyed by very disagreeable and offensive odors; the Cedar and Washington street and the A. H. Phillipi buildings are almost totally debarred from direct sunlight by the close proximity of other buildings and shade trees, in fact these buildings are so seriously affected in this way that they are unfit for occupancy, and should be condemned; the Elm street building above Ninth street also suffers considerably in this direction.

Heat and Ventilation.

There are some things common to all or nearly all school houses.

Window ventilation has to be resorted to in every building excepting that of the Laurel street, which is provided with the Smead system of heating and ventilating.

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This system is almost universally acknowledged at the present time as the best and most perfect.

The great efficiency of this system consists in throwing an immense volume of fresh, warm air into the rooms above the heads of the pupils, and by having a large number of openings along the sides and on a level with the floor for foul air exits, which lead to a large heated shaft at one end of the building, generates a strong suction and thus a healthy circulation of air is continually maintained.

In all the other buildings the principal induction of fresh air has to be made through the windows.

Quite a number are heated by steam, some are heated by hot air, which is introduced into each room by one register, and this air before heated is drawn into the furnaces in many instances right from the cellar floor, and in other cases by a box flue through the cellar window, thus utilizing the lower strata of air along the ground. In one building—that of Fourth and Elm streets, the furnace is fed with fresh air from the top of the building through a central shaft, and in each room there is a large register into this shaft which affords a very sensible mode of abstracting the foul air, and the hot air introduced into these rooms is pure. The Seventeenth and Cotton streets building has a peculiar provision.

It is heated by steam, but fresh air is provided through an opening above the N. E. outside door, thence through a channel between the door casing and the wall down into the cellar into a large tin tank along the middle wall against the ceiling, from which are run small flues into each room. The provision for the extraction of foul air in all but a few buildings is very poor and inadequate. The flues in the walls are small and commence either in the celler or on the first floor and end in the loft, having no exit through the roof.

They are small and neglected. Some have their registers closed, some open, and many are partially closed with cobwebs, brick or other debris.

At best the force of suction through them can only be very weak, whilst in many places they convey the damp and dusty air from the cellar into the rooms, or the foul air from the first floor to that of the second.

In a few, namely, in the Chestnut street, Twelfth and Windsor, Tenth and Union, and the Boys' High school the foul air flues run down into the cellar to the heating furnaces and into the main chimney, which, being heated, will produce a strong suction and a good foul air ventilation. The Thomas Severn, Samuel Frees, J. Hagenman, C. B. McKnight, Second and Oley and Tenth and Green No. 2 buildings, besides the usual small flues in the walls, have a register direct into the chimney, which increases very materially the abduction of foul air.

The Ninth and Spruce, the north section of the Bingaman and Orange, the Cedar and Washington, the Poplar street, the A. H. Phillippi and the Tenth and Green (old) buildings have solely a window ventilation.

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The following buildings are heated by stoves only, viz: The north section of the Bingaman and Orange, the Poplar street, the Cedar and Washington streets, and the A. H. Phillippi, together with a few rooms in a few other buildings.

Stove heating should be condemned. It heats the room too irregularly. When it is very cold and a large fire has to be maintained, those nearest the stove will nearly roast, while those around the outside nearest the walls will nearly freeze; and, then, in a crowded room with no ventilation excepting by the windows, it becomes a matter to the pupils and teachers of roasting, freezing and smothering with foul air.

Hot air, or rather warm air, heating is probably the best. But the capacities of these warm air heating furnaces should be large.

They should be fed with an abundance of fresh air drawn from the outside of the building and about ten or twelve feet above the ground, so as to avoid the lower strata of air which contain the most dampness, malaria influences and other deleterious substances and influences resulting from surface decompositions and emanations. They should then have the capacity of warming a large volume of air, which should be introduced into the school rooms through at least two or three large registers at different places.

Steam heat is good if of sufficient capacity to admit of introducing an ample amount of fresh air from the outside through the windows or some other avenue without creating a direct draught of cold air over the heads of the pupils; and, further, providing that the foul air flues are large enough and of proper construction and subject to heat in order to constitute a good and efficient foul air ventilation.

These should have their registers near the floor.

Cold air from the outside should be introduced by the windows, or by flues in such a manner that the current be directed upwards to strike the ceiling, so that it will thus be mixed sufficiently with warm air before it reaches the pupils, and thus avoid the dangers of a direct draught of cold air. This can be done by inserting a strip of wood below the lower sash, and thus breaking the connection between the two sashes in the middle, which will admit a sheet of fresh air with an upward direction. It may be introduced by lowering the upper sash and by putting opposite this opening a narrow screen placed at a proper angle, which will also direct the current upward and against the ceiling. Again, cold air may be introduced by flues or tubes through the windows or walls which are bent at right angles inside of the room. One or the other of these plans should by all means be adopted in all our school houses (excepting that of the Laurel street) being that the only avenue of introducing a sufficient supply of fresh air is through the windows, which is now done by lowering the upper sash or raising the lower one, which, in either case, is attended by dangerous and injurious draughts of cold air over the heads of the occupants of the rooms.

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There being plenty of literature extant on sanitation and hygiene, there is no longer any excuse for building contractors to be ignorant of the laws of proper heating, ventilation and light sufficiency.

The great defect in nearly all the buildings that have not enough light capacity lies in the fact that the windows do not extend high enough upward. They should extend up to within six inches of the ceiling.

Architectural features are also in a great many instances responsible for light deficiency.

Too much stress is laid on the beautiful appearance and the ornamental aspect of the building. They must have their pillars, their flanking projections, their roof projections, and all manner of shapes to give the building a pretty appearance on the outside.

What a pity that so fine a building as the Laurel street school, which is so perfect in all its other features, has to have its light supply of the north rooms botched. The south rooms have eight windows, giving a very large light capacity, the north rooms have four windows, and one of them on the first floor is right under a little portico roof, on account of which it scarcely amounts to anything. On the second floor a large portion of the very best light is cut off by the roof projection. What we want are plain square-shaped buildings, with large wide halls through the centre for stairways, cloak rooms and wash rooms; then you can utilize the whole outer wall surface unobstructed to let plenty of good light into all the rooms equally.

The life and health of the thousands of children occupying these buildings should at all times receive our attention in preference to the outward appearance of the buildings themselves.

Shading.

We found during the earlier part of our investigation that quite a number of school houses had their windows shaded with heavy inside and double-rowed slatted shutters, which were a decided nuisance.

In closing them they would shut out all the light, and in summer time besides shutting out the light, they would also shut out the air, and thus render the rooms hot and close. Furthermore, they were great dust gatherers in presenting an immense surface for dust to settle on, and being very hard to clean.

Much dust in a school room is dangerous and prejudicial to the health of the pupils on account of the vapory air containing organic matter being exhaled from their lungs, and becoming mixed with the dust constitutes a most fertile soil for disease germs to grow and thrive in. But since the reporting of the Franklin street building and the remodeling of the same, all inside shutters have been removed, excepting in one building, the Edwin Ziegler West building, and replaced by oil cloth shades of a light green or yellow color. These are placed on two rollers, one from the top to the centre, and the other from the centre to the

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bottom, which is about as good as anything that can be used for shading purposes.

Some authorities recommend the slat blinds that roll together, and the slats of which can be turned up or down to admit air or light, and so far they would answer an elegant purpose, but we think they are also objectional on account of their large capacity to gather dust.

Wall Paper.

We find that a large number of our school rooms are papered.

All authorities on school hygiene condemn wall paper in a school room, both on account of its absorbing properties and its throwing off arsenic. Moist, organic matter exhaled from the lungs and floating in the air may settle on and become absorbed by the paper on the walls and there produce very favorable conditions for the development and promotion of disease germs. It has been well established that paper on the walls will hold the infection of epidemic diseases for a long time.

By analysis it has been found that all wall paper contains arsenic, and that in a general way the more expensive the paper the greater is the percentage of arsenic in it. By the alternate action of moisture and dry heat on the paper, particles of it are constantly given off and permeate the air in the room which the occupants are breathing and thus become exposed to arsenical poisoning sufficiently to sicken them and debilitate their general system.

All walls and ceilings should be whitewashed or be simply plastered and of a light, dead, gray color.

Furniture.

The furniture of the school room deserves our most earnest attention.

This particularly embraces the desks and seats and the blackboards.

It is very easy to fill a room with desks and seats regardless as to size and how they are placed.

But it is not so easy and is of infinite importance to arrange them so that each child is fitted and seated properly, both as to its comfort and for the promotion of its physical equilibrium.

According to the rules laid down by our best authorities on school hygiene we find that our investigation develops the fact that very few of our school children are properly seated. Following is a table of dimensions of school desks and seats suitable for scholars of different sizes.

A comparison of this table with that of our table of actual measurements of the desks and seats in our schools will show the fact that the latter are very improperly proportioned.

And then by looking at the relation of the elbows of our pupils to the edge of the desks it will be seen how very improperly they are seated.

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	Height of scholar in inches.	Height of desk.	Height of seat.	Distance between seat and desk.	Distance between edge of seat and edge of desk.	
I, ...	38.56–42.91	17.86	11.8	6.06	1.97	The elbow of the scholar should be just from one-half to one inch below the edge of the desk.
II, ...	42.91–47.27	19.7	12.98	6.66	1.97	
III, ...	47.27–51.56	20.27	14.35	7.24	1.97	
IV, ...	51.56–55.86	23.6	15.7	7.9	1.97	
V, ...	55.86–60.26	25.76	17.27	8.48	1.97	
VI, ...	60.26–64.24	27.79	18.65	9.08	1.97	
VII.	64.24–68.90	29.76	20.09	9.66	1.97	
VIII, ...	over 68.90	31.5	21.27	10.26	1.97	

With a few exceptions the desks and seats in a room are all of one size, and in all the school houses taken together there are only about three or four distinct sizes.

In a primary class of pupils will be found some so small that their feet are dangling in mid-air and can not touch the floor when seated, while others are so large that they are constantly puzzled and annoyed with what disposition to make of their legs. This trouble runs more or less through all the classes. We even found one in an advanced grammar class whose feet did not touch the floor by a number of inches.

Now this disproportion of the desks and seats with the same in relation to the size of the pupils is a bad state of affairs, and is the strongest factor in producing short-sightedness and curvature of the spine.

You can not fit the scholar to his desk and seat, but you can fit the desk and seat to the scholar by introducing into each room at least about six or seven different sizes, with desk and seat properly related to each other and suited to the size of the scholars.

The desks and seats should be so proportioned and suited to the scholars that their feet will touch the floor, with the legs at right angles with the thigh, and the entire thigh on the seat; the edge of the seat should be about one-and-a-half or two inches within the edge of the desk, and the distance between the seat and the desk so that the elbow of the scholar be from one-half to one inch below the edge of the desk.

Then the scholar will sit easy and comfortably, and will not be forced to lean forward, raise his shoulder and assume a contorted position in doing his work.

The slope of the desk should also receive attention.

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Of course the model desk would be an adjustable desk, the slope of which could be made at any angle, say at about twenty degrees for writing and ciphering, or at sixty degrees for a book rest in reading or studying. But we could scarcely expect such a desk to be introduced into all the school rooms. A desk with a fixed slope at about forty-five degrees would probably be the most feasible or best adapted for general use.

Blackboards.

Blackboards are a necessity in a school room, and our schools are rather liberally provided for in this direction.

Generally they are placed on the side of the room in front of the scholars where there is no light entrance, which is all right.

But in some rooms we find blackboards on two sides, the one to the front and the other to the right. Now, where the pupils are required to copy from or observe any explanations by the teacher on the board on the side of the room to their right they will be required to turn in their seats and look sideways, and with the reflection of light on the board this will necessarily induce a forced vision and an eye strain.

These side blackboards should never be used in any other way but for direct work by the pupils.

We noticed in some rooms on the blackboards objects and words in different crayon colors, from white to the deepest crimson, which we believe has an injurious effect on the eyes.

Nothing but white should be used on a black surface, or black on a white surface.

Clothing.

In a majority of the rooms we find the children's clothing hung up along its sides with the hooks so close together that one child's clothing must necessarily hang on top of another's. This is wrong. The infection of disease, the constitutional infirmities, or the inflictions of filthy homes of some may thus be communicated to others, and in rainy or damp weather much damp clothing in the room may cause such diseases as rheumatism, sore throat and bronchial affections.

There should be clothes closets provided outside of the school rooms, with the hooks sufficiently far apart that one child's clothing would not touch another's.

Where there are wide halls through the entire building such provisions can be made. The exhalations from damp, filthy or contaminated clothing permeate the air of the entire room, and thereby the health of every pupil therein is jeopardized.

Janitors.

One of the most important equipments of a school house is a good, intelligent and efficient janitor. Too much care in this direction can not be exercised, since the whole management and carrying out of sanitary rules during school hours devolves principally upon the janitors.

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We are glad to state that we found a good many who deserve praise, and should like to designate them by name or location, but prudence prompts us to forbear doing so, since offense and pain might be given to others who may be equally sincere in doing the very best according to their ability.

"The qualities of janitors could be improved by the strict supervision of sanitary officers."

Over-crowding.

Taking the required air and floor capacities, according to our best authorities, and comparing them with the result of our investigations, we are convinced that quite a large number of our school rooms are rather seriously over-crowded. From 220 to 250 cubic feet of air and from 15 to 20 square feet of floor to each pupil is required to be consistent with health. To stay within these capacities very few rooms should have over forty pupils. But we find that a very large number of rooms contain from forty-five upwards, reaching even one hundred in two rooms.

Mental Pressure.

The following time to be employed during the twenty-four hours is considered consistent with health by our authorities: Between the ages of 12 and 17 from 5 to 6 hours; below 12, 4 hours; below 7, 2½ hours. Computing our regular school hours (5 hours) and the average time that our school children are employed outside of school at home in studying their lessons (from 10 minutes to 2 hours) we find their total employment not very much in excess of the above figures by taking into consideration the intermissions given to all the lower classes in the middle of each school session, and the employment for a short time of some light calisthenic exercises, whilst the youngest in the primary classes are always dismissed shortly after their recess.

Much harm can undoubtedly be done in requiring more work from young and tender school children than their various capacities will admit. The greatest injury generally accrues to the dull and stupid, since there is a wide gap between these and the brightest ones in their capabilities.

Here is a trouble that can never be reconciled as long as our school system does not recognize a difference in the mental capacity of children. If you gauge your lessons or tasks according to the mental capacity of the brightest ones you torture those who are naturally stupid, and expect too much of your teachers; and if you gauge your tasks according to the susceptibilities of the dull ones you will just furnish play for the brighter ones. To be fair to both they ought to be placed in separate classes. "The cramming for exhibitions and what Prof. Huxley calls the abomination of desolation of competitive examinations, prizes, etc., that goad on children of various strength and capacities to tasks that the brightest and strongest are hardly equal to, are responsible for much

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injury of mind and body as well as of sight; and the higher education that is now so earnestly demonstrated for the gentler sex is too often bought at the expense of shattered constitutions and unstrung nerves."

W. S. Robertson, A. M., M. D., of Iowa, says: "Just as the muscular system of a colt is ruined for life if its strength be too severely taxed, so the brain of a growing child will be irreparably injured if it be overworked."

"The common school system is radically wrong, in that it is wholly inelastic. It is governed by arbitrary and unchangeable rules to which the weak, the strong, the intellectual and the stupid must yield equal obedience. No discretion is given a teacher, but the feeble and the strong alike are forced through, regardless of physical ability or mental endowment."

Defective Vision and Spinal Curvature.

Impaired vision is perhaps the most common injury met with as a direct result of unsanitary conditions during school life. It has for some time been of common or frequent remark, why is it that so many of our school children wear glasses?

Among physicians it naturally directed their minds to a common cause, and that this common cause existed most likely in the school room, and consisting in some steady influence or influences that depreciated visual power. This subject gave a particular impetus to the investigation of school hygiene.

Although both near-sightedness and far-sightedness exist among the school children, yet, the former is by far the most frequently met with. Myopia or near-sightedness is almost universally acquired, or produced by extraneous causes which produce eye-strain. Hypermetropia or far-sightedness is generally congenital or inherited. By far the most of our school children affected with defective vision are myopes.

In our investigation we examined every eye with the test card only, and noted all those whose vision was defective by reading the letters on the card. Of course in the primary classes we had some trouble, and among those who did not know the letters a true test could not be made; but by trying them at the distance of twenty feet on small objects or script letters on the blackboard with which they were familiar, a more or less approximate test was arrived at. The following table will show the total number examined, with the corresponding number affected with defective vision. In the primary grade, total number examined was 5,809, number with defective vision 1,645, or 28 per cent; in the secondary grade, total number examined 1,787, number with defective vision 590, or 33 per cent; in the grammar grade, total number examined 556, number with defective vision 192, or 34¾ per cent; the high schools, total number examined 339, number with defective vision 124, or 36½ per cent; total number examined 8,491, number with defective vision 2,551, or 30 per cent.

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It will be seen by these figures that there is a steady increase of defective vision from the lower to the higher grades, and establishes beyond a doubt that there is a common and persistent cause or causes operating during school life, so that the longer children are exposed to these causes the larger will be the number to become affected with defective vision.

What are these causes? Firstly: insufficient light or light striking the pupils from the wrong direction. Secondly: improperly proportioned desks and seats. Thirdly: overtaxing lessons which involve too long a continued application of the eyes. Fourthly: bad heating and ventilation. Fifthly: all such other causes as tend to debilitate the general system, such as under-feeding, resuming their studies too early after convalescence from debilitating diseases, etc.

Insufficient light, light from the front blinding the pupils, or from the rear causing a shadow over their work by their bodies being interposed all produce eye strain. Improper desks and seats which cause the pupils to lean forward and twist to one side produces an abnormal vision by bringing their eyes too close to their work and inducing an engorgement of the blood vessels of the eyes, and hence an eye strain. Too long application in study and thus a prolonged tension of the eyes will produce fatigue and a yielding of the tissues of the muscles of the eyes. Too cold rooms will produce cold feet and cause a determination of blood to the head and a congestion of the eyes.

Bad ventilation debilitates the system and causes impairment and relaxation of tissues, from which the eyes will suffer. In a great many of our school buildings we find all these conditions combined.

Bad as the light and ventilation are in a great many rooms, we are inclined to believe that by far the most prolific cause of these eye troubles lies in the badly disproportioned desk and seats.

Let us quote a few authorities on this subject:

Dr. Gariel, Prof. a l'ecole de Medicine, Paris, chairman of a commission to examine the school room, says: "The commission find that myopia is caused by defective light, bad seats and desks, bad methods of writing, premature instruction and too fine print."

George C. Harlan, M. D., surgeon to Wills' Eye Hospital, says: "The size and form of the desk and its relation to the seat, are not without their effect upon the welfare of the eyes. To use desks and seats of the same pattern and size for a large number of children of all ages, is not more natural than the system of distribution of army clothing by which as Dickens complained all the tall soldiers got the short pantaloons and the short soldiers got the big ones.

"If a child is uncomfortably seated, he is pretty sure to lean forward on the desk, thus bringing his eyes too close to his work, and at the same time overfilling his blood vessels by gravitation.

"As the muscles of the back become fatigued by sitting long in a con-

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strained position, the tendency is to bend over more and more, and this faulty position at first assumed for temporary relief becomes by frequent repetition a confirmed habit, and may end in permanent deformity. Thus a relation is established between short sight and spinal curvature, and either may promote or increase the other."

Spinal curvature goes hand in hand with short-sightedness, and although a faulty position and badly disproportioned desks and seats are its chief cause and promoter, yet all other unsanitary conditions are also more or less direct or indirect contributing causes to the same result.

In referring to our table we find that out of 5,809 pupils examined in the primary grade 1,051, or 18 per cent. had spinal curvature, out of 1,787 in the secondary grade 366, or 20½ per cent., and out of 556 in the grammar grade 112, or 20 per cent., and out of 339 in the high schools 77, or 22.41 per cent.

Since every young man and woman justly pride themselves in an erect and regular figure it becomes rather a sad thing to find every fifth one of them lop-sided. Their own careless habits and faulty school room furniture must be held responsible for the deformity.

The seat being from two to five inches away from the desk and the distance between the seat and desk being so great that you find the children's elbows from two to six inches below the edge of the desk, they must necessarily lean forward, raise one shoulder and assume a sideway and crooked position; and this position frequently assumed and maintained for a length of time will result in permanent deformity.

Vaccination.

We find that out of 5,809 children in the primary grade 3,173, or 54.62 per cent. were not vaccinated, out of 1,787 in the secondary grade 634, or 35.64 per cent., out of 556 in the grammar grade 110 or 19.78 per cent., and out of 339 in the high schools 34 or 10.02 per cent. This shows for a number of years past vaccination has been sadly neglected, and that our city is ripe for a small-pox epidemic with all its attending ravages and dire results.

This should by all means awaken the earnest solicitations and interest among both parents and physicians to attend to the vaccination of all children. In fact the board of control should adopt and enforce a rule requiring every child to be vaccinated before it is admitted into any of our public schools.

There is no longer any use to listen to arguments against vaccination, for the statistics are so numerous and so overwhelmingly in its favor, as a sure protection against an attack of small-pox, that a refusal by any one to avail himself of this protection should be viewed almost as being criminal negligent. Every parent should regard it as a sacred duty towards his children as well as to the public to employ this safeguard against this much dreaded pest and destroyer of valuable human lives.

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We sincerely believe that were everybody properly vaccinated small-pox would be entirely wiped off our list of diseases.

Tobacco.

Out of the total number of boys in our public schools 676 use tobacco. That is they will chew or smoke a segar or cigarette whenever they can get hold of any. Some are already confirmed chewers or smokers. This is a bad habit for such young boys, and is undoubtedly fraught with many injurious effects on the nervous system and some of the internal organs, particularly the stomach and liver. We desire to call attention to an idiotic boy in the east room, second floor, of the old Tenth and Green building. This boy should not be allowed to come into the school room. He will never learn anything no matter how long he attends school. He is very rough in his behavior towards the other boys, and his peculiar actions of face and body are liable to be imitated by the other boys which might result in permanent injury.

Before closing our report we wish to make a special plea for the girls' high school.

This school building, of all others, should be one of the most comfortable, best heated, best ventilated and best lighted. We must remember that here we have the terminus of school life, embracing four years of hard study and close application; being that period of their history when these pupils are in their most active stage of physical development, and are making that critical transition from girlhood to womanhood.

The hygienic conditions of the present girls' high school building are decidedly bad.

It is poorly heated and very badly ventilated and lighted.

The air furnished to the rooms by the heating furnaces is drawn from the lower strata of air nearest the ground, which are damp and the most heavily charged with miasmatic poisons, and all those other deleterious gases and substances arising from surface decomposition of both vegetable and animal matter. It has no ventilation at all excepting by the windows, the small flues in the walls of the two assembly rooms do not amount to anything, some of them having their registers rusted fast and others are almost entirely obstructed with brick, plaster, cobwebs and other debris. The light deficiency we have already noted under the subject of light.

We found a class reciting in the laboratory room, crowded into a space of eight feet long and fourteen feet wide, sitting on common chairs placed together as closely as they possibly could be, with their feet on the crosspiece of the chairs in front of them, a book on their laps for a desk and with their bodies bent forward; in this tortuous and most uncongenial position they sat writing or taking notes during the greater portion of the hour's recitation; a most flagrant violation of all physiological laws.

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This building cannot be made, without an entire remodeling of the same, to offer proper accomodations with proper sanitary conditions for so large a number of pupils as are housed there now.

The normal development of both mind and body must go hand in hand. You can not have a sound mind in an unsound body "*Mens Sana in Corpore Sano.*"

It is just as important to provide sanitary conditions and surroundings for the promotion of the school children's health and bodily vigor, as to furnish them with text books and teachers for their mental training.

We are under many obligations to all the teachers for the kind reception we met with, and the ready and valuable assistance they gave us during the prosecution of our work in the school rooms. We found them all a hard working and devoted class of people, and believe them worthy of far better appreciation than the public generally accords them. We have been engaged in this work about two years, and in presenting this report as the result of our labor we kindly ask due indulgence for any imperfections it may contain.

A. B. DUNDOR, M. D.,
Member of the Committee on School Hygiene.

REPORT OF THE CITY OF SCRANTON.

Annual report of the Secretary of the Board of Health of the city of Scranton, Pa., made to the State Board of Health of Pennsylvania, for the year, beginning January 1, 1891, and ending December 31, 1891.

1. Name and address of members of board:

NAME.	Postoffice Address.
Samuel W. Edgar, secretary,	Scranton, Pa.
Ezra H. Ripple, chairman,	" "
W. A. Paine, M. D., member,	" "
J. K. Bently, M. D., member,	" "
Henry Zeigler, member,	" "
Michael Kelley, health officer,	" "

2. Twelve regular, two special meetings held by the board during the year.

3. Constantly increasing our sewer system.

4. Nuisances. Reported, 259; all have been satisfactorily arranged.

5. Communicable diseases:

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NAME OF DISEASE.	No. of cases.	No. of deaths.	No. of outbreaks.	No. of houses infected.	No. of outbreaks confined to the first house.
Small-pox,	.....	.....	.....	.....	.....
Diphtheria,	121	40	.....	.....	.....
Scarlet fever,	179	12	.....	.....	.....
Typhoid fever,	54	28	.....	.....	.....

6. These diseases are reported to the board by the physicians in attendance in accordance with the law ordinance or regulation requiring such reports.

7. Action taken by board when cases of the communicable diseases have been reported to it. Placard the house.

8. Houses in which cases of small-pox, diphtheria and scarlet fever occurred were placarded.

9. Diseases more than usually prevalent during the year, measles.

11. Schools. No special cases in which unhealthy conditions existed.

12. No particularly unhealthy localities.

13. Methods for improving the sanitary condition; clean streets, more sewers, crematory for destruction of garbage.

14. Sixty-four deaths from accidents of various kinds.

16. No food adulteration, or injurious effects from it.

17. No diseases of animals.

18. By-laws adopted by board in 1891. A few; will send revised manual soon as printed.

19. Our board is wide awake to all matters pertaining to the health of the city.

21. Compensation received by the secretary or health officer of board, or by other members. Secretary, $500 per year; health officer, $800 per year; food inspector, $900 per year; sanitary officer, $900 per year.

SAMUEL W. EDGAR,
Secretary.

March 21, 1892.

REPORT OF SHIPPENSBURG.

We have in our town organized at my solicitation a board of health, of which I am chairman, will you please forward any information as regards laws governing local boards.

Fraternally,
JOHN J. KOSER, M. D.

37 East Main Street, Shippensburg, Pa.

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REPORT OF CITY OF TITUSVILLE.

Annual report of the Secretary of the Board of Health of the city of Titusville, Crawford county, Pa., made to the State Board of Health of Pennsylvania, for the year beginning January 1, 1891, and ending December 31, 1892.

1. Name and address of each member:

NAME.	Postoffice Address.
Thomas L. Hobart, Jr., secretary,	Titusville, Pa.
George W. Barr, M. D., chairman,	"
M. J. Heywang, member,	"
Wm. Varian, M. D., member,	"
Charles L. Gibbs, member,	"
Barnard Abel, member,	"
Daniel McGrath, health officer,	"

2. Meetings held by the board during the year. Six.

3. Improvements or changes made. Considerable of an extension in water lines and sewerage during the past year.

4. Nuisances reported, seventeen; removed, sixteen.

5. Cummunicable diseases:

NAME OF DISEASE.	No. of cases.	No. of deaths.	No. of outbreaks.	No. of houses infected.	No. of outbreaks confined to the first house.
Small-pox,	.....	.....	.....	.....	These cases seem to have been scattering and only one to a house.
Diphtheria,	4	2	.....	.....	
Scarlet fever,	14	1	.....	.....	
Typhoid fever,	1	1	.....	.....	

6. These diseases are reported by the physician in attendance in accordance with the law ordinance or regulation requiring such reports.

7. They were speedily attended to and governed accordingly.

8. Houses in which cases of small-pox, diphtheria and scarlet fever occurred were placarded.

9. Diseases more than usually prevalent during the year. Measles, pneumonia, cholera infantum.

11. Nothing more than measles has been prevalent to an unusual extent, and as other children were forbidden to attend school from houses where this existed, measles was of short duration.

12. No particular locality of special mention.

14. No accidents.

16. No food adulteration.

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17. No diseases of animals.

18. By-laws were adopted.

21. Compensation received by the secretary or health officer of board, or by other members. The secretary received $125.00 for the year. The health officer received $75.00 for the year. None of the members any compensation.

Thomas L. Hobart, Sr., died November 10, 1891. His son, Thos. L. Hobart, Jr., was duly elected to fill the vacancy for the remainder of the term.

THOS. L. HOBART, JR.,
Secretary.

February 2, 1892.

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APPENDIX H.

METEOROLOGICAL OBSERVATIONS — PENNSYLVANIA STATE WEATHER SERVICE.

FOR JANUARY, 1892.

(Prepared under the direction of the Committee on Meteorology of the Franklin Institute.)

General Remarks.

The temperature during January was slightly below the normal, and nearer the normal than any preceding January since the establishment of the state weather service.

The periods of greatest cold were from the 8th to the 10th, and from the 17th to the 20th. The cold of the former period was more intense in the northwestern part of the state, the lowest temperature recorded being 28° below zero at Columbus. The second period of cold extended over the whole state.

Following is a tabulated statement of the mean temperature for January since this service has been in operation.

January, 1888, mean 22°.1, 5° below normal:
January, 1889, mean 31°.9, 5° above normal.
January, 1890, mean 37°.7, 11° above normal.
January, 1891, mean 30°.6, 4° above normal.
January, 1892, 26°.3, nearly normal.

The following statement of the average precipitation of the state for January for each year, shows that the average for 1892 is higher than any preceding year.

January, 1888, average 4.19 inches.
January, 1889, average 3.54 inches.
January, 1890, average 3.04 inches.
January, 1891, average 3.64 inches.
January, 1892, average 4.77 inches.

The periods of general and heavy precipitation were the 2d, 6th, 12th to 15th, 18th and 19th. In most sections snow covered the ground for sufficient length of time to protect the winter crops from serious injury from the cold.

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Temperature.

The mean temperature for January, 1892, was 26°.3 which is about one half degree below the normal, and 4°.3 below the corresponding month of 1891.

The mean of the daily maxima and minima temperatures 34°.2 and 18°.3 gives an average daily range of 15°.9 and a monthly mean of 26°.2.

Highest monthly mean, 34°.9 at Altoona.

Lowest monthly mean, 20°.4 at Smethport.

Highest temperature recorded during the month 66°.0, on the 14th, at Drifton.

Lowest temperature, minus 28°.0 on the 10th, at Columbus.

Greatest local monthly range, 77° at Sægerstown.

Least local monthly range, 45° at Harrisburg.

Greatest daily range, 54° at Columbus on the 10th.

Least daily range, 1° at Uniontown, on the 3d, and at Williamsport on the 15th.

From January 1, 1892, to January 31, 1892, the deficiency in temperature at Philadelphia was 33°, at Erie 74°, and at Pittsburg 74°.

Barometer.

The mean pressure for the month, 30.07, is about .03 below the normal. At the United States weather bureau stations, the highest observed was 30.67 at Harrisburg on the 17th, and the lowest, 29.31 at Philadelphia on the 13th.

Precipitation.

The average precipitation, 4.77 inches for the month, is about 1.17 inches above normal.

The largest totals in inches (including melted snow) were Girardville, 8.46; Coopersburg, 6.98; Coatesville, 6.76, and Pottstown, 6.46.

The least were Altoona, 2.08; Newcastle, 2.75, and Columbus, 2.79.

The snowfall average for the state was about 13.50 inches.

The largest totals in inches were Sægerstown, 40.6; Blue Knob, 32.5; Lock Haven, 20.9, and Columbus, 20.

Wind and Weather.

The prevailing wind was from the northwest.

Average number: Rainy days, 12; clear days, 8; fair days, 8; cloudy days, 15.

Verification of Weather Forecasts.

Percentage of local verifications of weather and temperature signals as reported by displaymen:

Weather, 85 per cent.

Temperature, 88 per cent.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for January, 1892.*

County	Station.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean of maximum.	Mean of minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg.*	847	30.11	30.62	29.38	28.0	60	1	2	20	34.1	22.0	12.1	24	10	5	23
Berks	Hamburg	330				27.3	60	14	2	17	35.0	19.6	15.4	30	15	2	4,6
Berks	Reading	260															
Blair	Altoona.†	1,181				34.9	55	3,4	8	8	43.7	27.2	16.5	35	26	6	29
Blair	Blue Knob	2,500				21.4											
Blair	Hollidaysburg	947				26.6	49	2	—8	10	35.0	16.3	18.7	35	10	5	23
Bradford	Wysox	718	30.07	30.66	29.40	24.8	50	1	—6	20	30.7	16.3	14.4	35	22	2	31
Bradford	LeRoy	1,400				21.9	48	2	—5	20,26	28.0	15.8	12.2	21	11	2	13
Bucks	Hulmeville *		30.03	30.65	29.15	28.2	60	2	0	17	36.9	19.5	17.4	32	17	4	11
Bucks	Forks of Neshaminy					30.6											
Bucks	Quakertown	536															
Cambria	Johnstown.*	1,184															
Cameron	Emporium	1,050				24.9	47	2	—14	10	32.8	15.3	17.5	37	22	6	13,25
Centre	State College	1,191	30.02	30.62	29.28	24.9	47	2	—3	20	31.5	17.7	13.8	36	26	3	6
Chester	West Chester	455	30.04	30.59	29.19	29.2	60	14	8	20	36.9	21.7	15.2	27	26	5	30
Chester	Coatesville	380				27.4	62	14	—1	17	38.6	18.0	18.6	36	17	6	30
Chester	Kennett Square.*	275				28.2	62	14	6	17							
Chester	Phœnixville.*	183	30.07	30.68	29.48	28.4	62	14	—1	17	37.5	19.4	18.1	28	17	7	12
Chester	Westtown (28 days)	350	30.03	30.48	29.43	30.3	60	14	10	20	37.4	23.2	14.2	24	2	6	11,31
Clearfield	Grampian Hills	1,450				22.0	44	2	—10	20	27.4	16.4	11.0	26	20	2	13,19
Clinton	Lock Haven	560				26.9	49	2	—3	20	32.8	17.4	15.4	27	17	4	3,6
Crawford	Meadville	1,300				23.8	52	1	—18	10	34.1	13.4	20.7				
Crawford	Saegertown					23.5	50	1	—27	10	31.5	7.5	24.0	46	10	6	30
Cumberland	Carlisle	480				27.9	56	14	3	21	37.3	20.2	17.1	35	21	6	13,30
Dauphin	Harrisburg.*	361	30.06	30.67	29.40	27.8	58	2	8	17	33.9	21.6	12.3	28	28	5	31
Delaware	Swarthmore College.*	190	30.06	30.59	29.41	29.8	60	2	6	17	37.7	22.0	15.7	27	28	6	3
Erie	Erie.*	681	30.06	30.56	29.42	24.0	53	1	2	10	30.2	17.6	12.6	27	11	5	14
Fayette	Uniontown	1,000				30.0	62	1	—9	20	35.6	22.7	12.9	30	10	1	3
Fulton	McConnellsburg	875				28.7	54	25	4	8	38.0	20.3	17.7	35	28	6	31
Huntingdon	Huntingdon.*	650				27.2	51	2	—2	10	36.1	18.4	17.7	34	10	8	14,31
Lancaster	Lancaster (24 days)	413		30.67	29.34	27.5	55	14	7	20	35.3	19.7	15.6	30	26	5	18
Lawrence	Newcastle	932				25.2	55	1	—20	20	32.1	15.4	16.7	39	10	6	13,29

* Observations taken at 8 a. m. and 8 p. m.

† Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station.	Elevation.	Barometer Reduced to Sea Level.			Temperature.												
							Maximum.		Minimum.				Daily Range.					
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Lebanon,	Lebanon,	474	30.05	30.65	29.33	27.6	58	14	0	17	36.5	19.9	16.6	27	21	6	11
Lehigh,	Coopersburg,	520	....	....	....	27.0	58	14	1	17	38.2	19.2	19.0	32	17	8	30
Luzerne,	Drifton (25 days),*	1,655	30.01	30.58	29.44	25.0	66	14	1	20	33.0	16.0	17.0	38	18	5	23
Luzerne,	Wilkesbarre,*	575	....	....	....	27.5	61	14	2	20	36.5	18.5	18.0	30	15	7	13, 31
Lycoming,	Williamsport (22 days),*	....	....	....	....	26.0	48	29	2	10	33.0	19.0	14.0	25	29	1	15
McKean,	Kane,*	....	....	....	....	21.8	48	13	- 9	20	28.9	14.8	14.1	33	10	4	3
McKean,	Smethport,	1,100	....	....	....	20.4	49	2	—22	20	....	....	....	....	....	....	....
Montgomery,	Pottstown	150	....	....	....	28.7	60	14	3	17	36.0	21.5	14.5	24	2	6	12
Philadelphia,	Philadelphia Weather Bureau,*	117	30.07	30.65	29.31	31.4	62	14	11	27	38.1	24.8	13.3	26	19	5	15
Philadelphia,	Philadelphia, Centennial avenue,*	120	30.07	30.66	29.37	32.3	61	14	12	27	39.9	24.7	15.2	26	26	7	6
Philadelphia,	Philadelphia, Haverford street,*	104	....	....	....	29.6	60	14	10	17, 21	36.4	22.6	13.8	27	21	5	30
Schuylkill,	Girardville,	1,000	30.02	30.50	29.49	26.2	58	14	3	20	34.0	19.0	15.0	31	26	6	6
Snyder,	Selinsgrove,	445	30.08	30.61	29.40	26.4	62	2	0	20	33.7	18.8	14.9	29	4	5	30
Somerset,	Somerset,	2,250	....	....	....	24.3	50	2	- 8	10	32.3	16.3	16.0	36	10	4	29
Sullivan,	Eagles Mere,	2,060	....	30.63	29.47	22.3	54	13	—8	27	27.0	13.5	13.5	28	1	4	23
Tioga,	Wellsboro,	1,327	30.08	30.68	29.36	22.1	45	2	—14	10	29.5	15.3	14.2	23	20	4	26
Union,	Lewisburg,	450	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Warren,	Columbus,	1,410	....	....	....	20.9	44	2	- 28	10	28.2	13.5	14.7	54	10	2	23
Wayne,	Dyberry,	1,100	....	....	....	21.4	53	2	- 8	10	31.2	12.1	19.1	33	17	5	13
Wayne,	Honesdale,	1,000	....	....	....	23.5	55	2	—3	10	31.6	15.4	16.2	32	17	5	31
Westmoreland,	Ligonier,	1,750	....	....	....	27.8	55	2	—10	10	39.0	16.7	12.3	33	17	6	13
Wyoming,	South Eaton,*	660	....	....	....	25.4	56	14	—1	20	33.4	17.4	16.0	36	26	3	24
York,	York,*	385	30.02	30.55	29.35	26.8	57	2	- 6	17	35.4	17.8	17.6	32	17	6	12

Observations taken at 8 a. m. and 8 p. m.

Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County	Station.	Relative humidity.	Dew point.	Precipitation. Total, including melted snow.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing Direction. 7 a. m.	Wind. Prevailing Direction. 2 p. m.	Wind. Prevailing Direction. 9 p. m.
Allegheny,	Pittsburg,*	74.0	20.1	3.29	...	13	6	3	22	NW	...	NW
Berks,	Hamburg,	...	...	5.25	...	9	1	16	14	...	...	...
Berks,	Reading,	...	...	5.94	...	...	...	...	...	...	...	...
Blair,	Altoona,†	66.4	24.5	2.08	.6	11	...	...	...	...	...	...
Blair,	Blue Knob,	...	...	5.41	32.5	16	4	8	19	NW	NW	NW
Blair,	Hollidaysburg,	75.0	20.0	3.51	8.2	10	7	9	15	W	W	W
Bradford,	Wysox,	84.0	21.0	3.61	8.5	9	10	4	17	E	NW	NW
Bradford,	LeRoy,	...	...	4.60	12.3	14	5	6	20	SW	SW	SW
Bucks,	Hulmeville,*	...	...	5.13	12.0	9	11	4	16	NW	...	N
Bucks,	Forks of Neshaminy,	...	...	4.60	...	11	11	10	10	N	W	W
Bucks,	Quakertown,	...	...	5.35	14.0	...	...	...	...	...	...	...
Cambria,	Johnstown,*	...	...	...	...	...	...	...	...	...	...	...
Cameron,	Emporium,	81.9	19.8	3.29	12.5	9	5	4	22	NW	W	NW
Centre,	State College,	90.2	22.5	3.98	9.5	11	6	6	19	W	W	W
Chester,	West Chester,	71.0	20.5	5.80	12.5	13	13	5	13	NW	SW	NW
Chester,	Coatesville,	...	...	6.76	18.2	11	10	7	14	W	W	W
Chester,	Kennett Square,*	...	...	5.82	14.0	10	9	5	17	NW	...	NW
Chester,	Phœnixville,*	76.5	22.1	6.11	...	11	6	7	18	NW	...	NW
Chester,	Westtown (28 days),	...	...	4.32	12.9	12	5	10	13	W	W	W
Clearfield,	Grampian Hills,	...	...	3.49	16.0	14	4	8	19	SW	W	W
Clinton,	Lock Haven,	...	...	4.11	20.9	13	9	5	17	W	W	W
Crawford,	Meadville,	...	...	...	...	...	3	10	18	W	...	SW
Crawford,	Sœgertown,	...	...	5.00	40.6	16	1	13	17	SW	SW	SW
Cumberland,	Carlisle,	83.0	23.0	5.64	8.5	12	8	8	15	NW	NW	W
Dauphin,	Harrisburg,*	68.9	18.5	5.14	9.5	11	9	6	16	W	...	W
Delaware,	Swarthmore College,*	84.0	23.0	4.20	13.5	10	9	8	14	NW	...	NW
Erie,	Erie,*	82.0	18.0	3.26	...	20	0	14	17	SW	...	SW
Fayette,	Uniontown,	...	...	4.34	12.0	12	10	10	11	SW	SW	SW
Fulton,	McConnellsburg,	74.6	28.8	4.25	8.0	10	9	10	12	NW	W	NW
Huntingdon,	Huntingdon,*	...	...	4.22	9.2	10	9	7	15	W	...	W
Lancaster,	Lancaster (24 days),	80.3	25.7	4.39	2.0	8	6	12	6	N	...	N
Lawrence,	Newcastle,	...	...	2.75	15.5	15	4	8	19	SE	SE	SE

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station.	Relative humidity.	Dew point.	Precipitation. Total, including melted snow.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing direction. 7 a. m.	Wind. Prevailing direction. 2 p. m.	Wind. Prevailing direction. 9 p. m.
Lebanon,	Lebanon,	80.6	22.8	6.27	13.5	15	9	10	12	NE	SW	NW
Lehigh,	Coopersburg,	...	...	6.98	13.2	13	11	5	15	NW	NW	NW
Luzerne,	Drifton (26 days),*	83.0	23.0	4.98	14.0	6	9	3	13	...	...	...
Luzerne,	Wilkesbarre,*	..	...	6.23	18.5	11	12	2	17	NW	...	NW
Lycoming,	Williamsport (22 days),*	...	...	3.97	7.5	10	7	8	7	W	...	W
McKean,	Kane,*	...	...	...	...	...	...	...	...	...	...	...
McKean,	Smethport,	...	...	...	...	...	5	10	16	SW	...	SW
Montgomery,	Pottstown,	74.0	21.0	6.46	15.0	8	14	5	12	W	W	W
Philadelphia,	Weather Bureau,*	73.0	22.2	4.48	11.2	13	10	5	16	NW	...	NW
Philadelphia,	Philadelphia, Centennial avenue,*	78.0	24.0	5.06	12.3	13	14	7	10	NE	NW	NE
Philadelphia,	Philadelphia, Haverford street,*	...	...	...	...	...	11	3	17	NW	...	NW
Schuylkill,	Girardville,	...	...	8.46	13.5	14	9	8	14	W	W	W
Snyder,	Selinsgrove,	84.8	23.4	5.13	8.2	7	8	10	13	NW	NW	NW
Somerset,	Somerset,	...	...	3.05	16.0	14	4	3	24	SW	SW	SW
Sullivan,	Eagles Mere,	71.0	12.6	6.19	16.4	13	7	16	8	SW	SW	SW
Tioga,	Wellsboro,	83.3	17.5	3.67	16.0	12	4	8	19	SW	W	NW
Union,	Lewisburg,	...	...	...	...	...	...	...	...	...	...	...
Warren,	Columbus,	67.0	10.0	2.79	20.0	17	4	12	15	SW	SW	SW
Wayne,	Dyberry,	...	...	5.65	12.5	11	6	9	16	W	W	W
Wayne,	Honesdale,	...	...	5.32	12.0	12	...	...	...	...	...	...
Westmoreland,	Ligonier,	...	...	3.11	15.5	5	3	21	7	...	...	...
Wyoming,	South Eaton,*	...	...	5.38	10.0	13	7	5	19	S	...	NW
York,	York,*	88.1	22.6	6.08	13.0	12	13	5	13	NW	...	NW

* Observations taken at 8 a. m. and 8 p. m.

† Observations taken at 12 noon.

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PRECIPITATION FOR JANUARY, 1892.

DATE	Altoona.	Blue Knob.	Browers' Lock.	Carlisle.	Coatesville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Eagles Mere.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian Hills.	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.
1,													.01								
2,	.18	.30	.75	.96	.99	.22	1.26	1.12	1.19	.90	1.08	.33	.23	1.18	.84	1.60	.14	.43	.99	.24	.98
3,		.35		.03		.17				.24			.44				.05		T		
4,		.25			.07	.04	.01				.04	.05	.05			.04	.12		.04	.12	
5	.05			.10		.05							.07					.23			
6,	.15	.70	.24	.54	.70	.32	.41	.12		.34	.39	.49	.49	.10	.07	.36	.40		.15	.47	.39
7,	.08	.35				.16					.15	.08	.22				.07				
8,	.02					.08					.18		.02				.10				.02
9,		.20											.02			.07	.02		T		
10,																					
11,		.05			T		.01						.01	.03		.06			T		.04
12,	.02	.36		.05	.42	.05	.23	.08	.14	.15	.87	.08	.02	.08	.11	.80	.38	.21	.40	.63	
13,	.68	.77	1.84	1.42	1.21	.40	1.86	1.78	1.15	1.30	1.05	.34	.21	1.60	1.07	1.20	.66	1.80	1.02	.73	1.47
14,	.59	.53	.49	.72	.67	.55	1.00	.51	1.32	1.05	.98	1.33	.55	.34	.72	1.20	.86	.85	.87	.49	.98
15,		.20	.44	.27	.80	.07	.55	.87		.29	.28		.04	.26	.49	1.08		.26	.16		.29
16,		.10											.04								
17,													T						.64		
18,	.20	.35	.20	.28	.73	.24	.65	.22	.61	.83	.22	.42	.20	.21	.41	.80	.52	.63		.55	.99
19,	.20	.15	.71	.76	.71	.23	.94	.77	.53	.47	.23	.17	.58	.67	.74	.84	.10	.77	.54	.12	.10
20,			.07	.17	.05		.01														
21,													T								
22,						.05							.01								
23,		.40				.05				.04	.35		.04			.12	.04		T		.01
24,							.04			.64			T	.03		.23			T		.07
25,						.04							T								
26,													T								
27,													T								
28,						.04							T								
29,		.45			T												.06		.20	.15	
30,	.05		.17	.32	.31		.02	.14			.42		.01	.10	.11	.13		.07	.33	.01	.06
31,																					
Total,	2.08	5.41	4.91	5.64	6.76	2.79	6.98	5.55	4.93	5.65	6.19	3.29	3.26	4.60	5.16	8.46	3.49	5.25	5.14	3.51	5.32

* United States Weather Bureau stations.

T indicates a trace of precipitation.

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PRECIPITATION FOR JANUARY, 1892—*Continued.*

DATE.	Hulmeville.	Huntingdon.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	LeRoy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	Meadville.	McConnellsburg.	Newcastle.	Ottsville.	Philadelphia.*	Philadelphia.	Phœnixville.	Pittsburg.*
1.																.08					
2.	1.25	.73			1.25		1.14	.42	.71			.44			.44	.07	1.40	.91	1.00	.90	.06
3.									.05							.05		T	T		.09
4.		.26						.06	.02			.08			10	.10		.02	.08		.02
5.								.01	T												T
6.	.25	.27			.52		.32	.34	.45			.40			.20	.62	.60	.34	.40	.46	.41
7.									.05							.21					T
8.									T			.10				.03					.02
9.								.01	.05		.70							.02	T		
10.																					
11.								.02	T									.02	.01	.02	T
12.		.18			.15	.28	.02	.44	.10			.05					.05	.11	.12	.15	.33
13.	1.70	.89			1.50	.38	1.62	1.21	.80		1.20	.77			1.45	.36	.95	1.37	1.41	1.84	.55
14.	.57	.62			.38	1.32	.48	1.11	1.01		.45	.45			.29	.80	.82	.20	.21	.60	.96
15.	.40	.10			.85	.90	.62	.61	.10			.10			.25	.02	.90	.50	.65	.64	T
16.																					T
17.																					
18.	.50	.51			.09	.85	.21	1.10	.10			.50			.60	.22		.16	.21	.35	.26
19.	.25	.40			.87	.51	.54	.58	.95			.50			.44	.30	.30	.49	.66	.89	.19
20.	.21				.08													.18	.10	.02	
21.																					
22.																					
23.								.01	T							.01					T
24.								T	.05			.30					.01	T	.01		
25.											.10										
26.																			T		.01
27.																					T
28.																					
29.						.05		.15				.38			.33	.01					.38
30.		.32			.13	.10	.16	.20	.16		.66	.04			.15	.02	.08	.16	.20	.24	.01
31.																					
Total.	5.13	4.23			5.82	4.39	5.11	6.27	4.60		3.11	4.11			4.25	2.75	5.06	4.48	5.06	6.11	3.29

T indicates a trace of precipitation.

* United States Weather Bureau stations.

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PRECIPITATION FOR JANUARY, 1892—*Continued.*

DATE.	Point Pleasant.	Pottstown.	Quakertown.	Reading.	Siegertown.	Selsholtzville.	Selinsgrove.	Smethport.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport	Wysox.	York.
1.				.80																.53	
2.	1.14	.85	.99	.02	.16	1.19	1.04		1.06	.62	1.20	.64	.65	.09	1.20	1.09	.70	.77			.37
3.					.50					.06	.07	.08		.11			.05				
4.				.01	.15					.20		.06	.05	.12		.05		.30	.05		.10
5.					.10									.10							
6.	.40	.45	.50	.58	1.00	.40			.06	.45	.41	.19	.30	.12	.52	.45	.45		.41	.28	.60
7.					1.00					.10		T			.05			.20			
8.					.20					.12		T		.04	.10						
9.																	.04				
10.																					
11.	.30			.01					.05							.08	.05				.06
12.		2.00		.10	.12		.52		.11	.25	.11	.54		.64	.20	.32	.81	.42	1.16	.94	.20
13.	2.04		1.33	1.80	.63	1.90	.47		1.82	.10	1.04	.92	1.56	1.00	.65	1.38	.10	1.40	.84	.99	1.28
14.	.70	.83	.83	.85	.49	.70	.75		.51	.30	1.04	.49	.17	.73	.10	.44	.50	.92	.06		1.22
15.	.56	.95	.50	.62	.04	.45			.28	.07	.10	T	.17		.10	.70	.50	.40	.05	.09	.48
16.																					
17.																	.80				
18.	.37	.90	.26	.84	.23	.62	.96		.37	.26		.46	.30	.54	.35	.40			.75	.48	.70
19.	.70	.40	.79	.59	.30	.64	.29		.91	.14	1.06	.39	1.17	.44	.30	.65	.20	1.30	.32	.15	.51
20.			.06	.03							.13		.30			.06					
21.																					
22.					.02																
23.				.01	.03					.07		T									
24.	.07		.08	.01					.06		.10	T				.02		.27	.15	.07	
25.																					
26.				.01	.03										.05			.10			
27.																					
28.																					
29.							.10			.31	.04	.08		.41							.20
30.	.08	.08	.06	.16		.07					.06	.16	.23		.05	.17	.12	.15	.18	.08	.36
31.											.03										
Total.	6.31	6.46	5.35	5.94	5.00	5.97	5.13		5.23	3.05	5.38	3.98	4.20	4.34	3.67	5.80	4.32	6.23	3.97	3.61	6.08

* United States Weather Bureau stations.

T indicates a trace of precipitation.

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FOR FEBRUARY, 1892.

General Remarks.

The mean temperature of the state for February was nearly three degrees above the normal. No definite periods of heat or cold occurred. Generally the highest temperatures were recorded during the latter part, and lowest temperature about the middle of the month.

The following is a tabulated statement of the mean temperatures for February since the establishment of the state weather service:

February, 1888, mean 28°.4, 1°.0 below normal.
February, 1889, mean 23°.0, 6°.0 below normal.
February, 1890, mean 37°.1, 8°.0 above normal.
February, 1891, mean 34°.9, 6°.0 above normal.
February, 1892, mean 31°.7, 2°.7 above normal.

The amount of precipitation during the month was considerably below the normal.

Except in some elevated sections, but little snow fell. Many observers report that winter grain has been injured by exposure to freezing and thawing weather.

From the following statement of the average precipitation for each year, it will be seen that the average for February, 1892, is lower than any preceding year:

February, 1888, average 2.50 inches.
February, 1889, average 1.86 inches.
February, 1890, average 4.32 inches.
February, 1891, average 4.61 inches.
February, 1892, average 1.75 inches.

Temperature.

The mean temperature for February, 1892, was 31°.7, which is nearly 3°.0 above the normal and 3°.2 below the corresponding month of 1891.

The mean of the daily maxima and minima temperature, 32°.1 and 24.°1, give an average daily range of 15°.0 and a monthly mean of 31°.6.

Highest monthly mean, 36°.9 at Uniontown.

Lowest monthly mean, 35°.6 at Dyberry.

Highest temperature recorded during the month, 32°.0, on the 25th, at Pittsburgh.

Lowest temperature, minus 18°.0, on the 13th, at Sægertown.

Greatest local monthly range, 71°.0 at Sægertown.

Least local monthly range, 37°.0 at Swarthmore.

Greatest daily range, 18°.0 at Uniontown on the 6th.

Least daily range, 0.0 at Westtown on the 30th.

From January 1, 1892, to February 29, 1892, the deficiency in temperature at Philadelphia was 36°, at Erie 42°, and at Pittsburg an excess of 10°

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Barometer.

The mean pressure for the month, 30.14, is about .04 above the normal. At the United States weather bureau stations the highest observed was 30.74 at Pittsburg, on the 17th, and the lowest 29.29, at Erie, on the 11th.

Precipitation..

The average precipation, 1.75 inches for the month, is a deficiency of 2.50 inches.

The largest totals in inches (including melted snow) were Blue Knob, 4.48; Sægertown, 4.24; Emporium, 3.77, and Columbus, 3.71.

The least were Swarthmore, 0.43; Philadelphia [Centennial avenue], 0.88; South Eaton, 0.91; Hamburg, 0.44; Drifton, 0.36; Philadelphia, [Haverford street], 0.81.

The snowfall was light outside of the more elevated sections. Blue Knob, 22.2; Grampian Hills, 18.5; Emporium, 16.0, and Sægertown, 16.0 inches.

Wind and Weather.

The prevailing wind was from the northwest.

Average number: Rainy days, 9; clear days, 7; fair days, 7; cloudy days, 15.

Verification of Weather Forecasts.

Percentage of local verifications of weather and temperature signals as reported by displaymen: Weather, 88 per cent.; temperature, 92 per cent.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for February, 1892.*

County.	Station.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean of maximum.	Mean of minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg.*	847	30.15	30.74	29.40	36.2	62	25	12	12	43.3	29.0	14.3	29	25	4	3
Berks	Hamburg.	380	....	....	....	32.8	55	26	12	13	39.9	25.9	14.0	38	18	6	3,21
Berks	Reading.	280	....	....	....	31.0	44	23	15	13	....	....	....	....	....	....	....
Blair	Altoona.†	1,181	....	....	....	39.0	55	2,19	17	17	46.0	32.1	13.9	25	12	6	4
Blair	Blue Knob.	2,500	....	....	....	27.2	45	2	-6	13	34.6	19.9	14.7	34	13	3	19
Blair	Hollidaysburg.	947	....	....	....	32.6	57	10	1	6	40.6	22.6	18.0	40	18	8	4,21
Bradford	Wysox.	718	30.18	30.69	29.35	29.1	48	26	8	13,17	35.5	22.2	13.3	38	18	4	3
Bradford	Le Roy.	1,400	....	....	....	26.7	43	18,26	4	13,17	32.4	21.0	11.4	32	18	3	3
Bucks	Hulmeville.*	....	30.13	30.68	29.25	33.5	53	8	14	6	40.2	26.9	13.3	35	18	2	21
Bucks	Forks of Neshaminy (27 days).	....	....	....	....	34.9	....	....	....	....	....	....	....	....	....	....	....
Bucks	Quakertown.	536	30.16	30.66	29.41	31.9	52	22	8	13	40.0	23.2	16.8	33	14	7	8
Cambria	Johnstown.*	1,184	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cameron	Emporium.	1,050	....	....	....	31.3	51	18	5	17	38.7	22.7	16.0	45	18	4	4
Carbon	East Mauch Chunk.	550	....	....	....	31.7	53	22	9	13,18	39.3	23.4	15.9	42	18	6	2,21
Centre	State College.	1,191	30.11	30.60	29.30	30.1	52	18	1	17	37.1	23.8	14.3	39	18	5	4
Chester	West Chester.	455	30.13	30.64	29.24	33.2	52	8	12	13	40.2	27.0	13.2	32	18	5	21
Chester	Coatesville.	380	....	....	....	32.8	55	8	11	6	42.3	25.3	17.0	39	18	7	21
Chester	Kennett Square.*	275	....	....	....	32.0	....	....	....	....	....	....	....	....	....	....	....
Chester	Phœnixville* (22 days).	183	30.07	30.72	29.36	33.8	54	8	14	13	40.4	25.1	15.3	33	18	6	21
Chester	Westtown (27 days).	350	....	....	....	34.3	52	8	11	6	40.0	28.6	11.4	30	18	0.5	20
Clearfield	Grampian Hills.	1,450	....	....	....	28.4	48	22,26	0	13	37.7	22.7	15.0	28	18	2	3,21
Clinton	Lock Haven.	560	....	....	....	31.5	51	23	7	17	37.9	22.9	17.0	33	18	3	3
Crawford	Meadville (20 days).	1,300	....	....	....	30.3	58	18	—9	13	39.7	19.4	20.3	30	13	5	19
Crawford	Saegerstown.	....	....	....	....	29.0	53	24	—18	13	39.1	18.9	20.2	40	13	5	20
Cumberland	Carlisle.	480	....	....	....	32.8	54	22,23	16	6,16	41.3	25.7	15.6	38	18	4	21
Dauphin	Harrisburg.*	361	30.17	30.72	29.42	32.6	50	18	11	13	38.4	26.7	11.7	32	18	6	21
Delaware	Swarthmore College.*	190	30.16	30.80	29.37	35.4	53	8	14	13	41.0	29.8	11.2	28	18	3	21
Erie	Erie.*	681	30.10	30.71	29.29	29.0	50	24	8	13	35.8	22.8	13.0	33	18	2	21
Fayette	Uniontown.	1,000	....	....	....	36.9	60	25	0	6	44.0	28.9	15.1	48	6	2	3
Fulton	McConnellsburg.	875	....	....	....	34.0	60	1	2	6	43.2	25.7	17.5	37	6	4	11
Huntingdon	Huntingdon.*	650	....	....	....	33.1	58	1	9	6,13	42.5	23.6	18.9	42	18	9	19
Lancaster	Lancaster.*	413	30.15	30.72	29.24	33.3	59	1	13	17	40.7	26.0	14.7	32	1	7	21

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Lawrence.	Newcastle.	983	....	....	....	34.9	54	24,25	5	13	41.2	23.8	17.4	30	7	4	11
Lebanon.	Lebanon.	458	30.12	30.70	29.29	33.0	55	22	13	13	40.8	26.9	13.9	34	18	4	21
Lehigh.	Coopersburg.	520	....	....	....	32.5	54	22	11	13	41.6	26.2	15.4	32	18	4	3
Luzerne.	Drifton* (24 days).	1,655	30.10	30.65	29.39	27.2	48	26	4	29	35.1	19.5	15.6	32	18	3	20
Luzerne.	Wilkesbarre.*	575	....	....	....	33.3	57	29	11	13.17	42.6	24.1	18.5	32	29	11	9
Lycoming.	Williamsport* (27 days).	....	....	....	....	33.4	55	26	12	6,13	40.6	26.1	14.5	30	18	2	29
McKean.	Kane.*	....	....	....	....	27.6	49	18	2	17	34.4	20.8	13.6	32	18	4	4
McKean.	Smethport.	1,500	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Montgomery.	Pottstown.	150	....	....	....	34.2	51	8,26	12	13	40.6	27.9	12.7	32	18	5	3
Philadelphia.	Weather Bureau.*	117	30.16	30.70	29.37	35.2	54	8	14	13	41.1	29.3	11.8	29	18	3	21
Philadelphia.	Centennial Avenue.*	120	30.15	30.72	29.37	36.0	58	8	15	13	42.7	29.4	13.3	30	18	5	21
Philadelphia.	Haverford Street.*	104	....	....	....	34.0	52	8	14	13	39.4	28.7	10.7	28	18	4	21
Schuylkill.	Girardville.	1,000	30.10	30.66	29.10	30.3	50	22,23	9	13	38.2	24.1	14.1	36	18	8	20,21
Snyder.	Selinsgrove.	445	30.18	30.67	29.46	30.8	50	23	5	13	37.2	24.8	12.4	26	18	5	8,29
Somerset.	Somerset.	2,250	....	....	....	30.1	54	25	—15	6	26.9	22.6	14.3	37	6	5	12
Sullivan.	Eagles Mere.	2,060	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tioga.	Wellsboro.	1,327	30.14	30.60	29.27	26.9	50	1	2	16	34.4	20.8	13.6	39	18	4	29
Union.	Lewisburg.	450	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Warren.	Columbus.	1,410	....	....	....	29.8	57	25	—3	6,17	37.9	21.6	16.3	39	6	1	8
Wayne.	Dyberry.	1,100	....	....	....	25.6	48	22	—2	14,18	33.4	17.7	15.7	47	18	4	21
Wayne.	Honesdale.	1,000	....	....	....	27.6	48	26	1	18	35.0	20.2	14.8	40	18	3	3
Westmoreland.	Ligonier.	1,750	....	....	....	33.2	60	23	—6	6	44.6	22.8	21.8	44	6	1	18
Wyoming.	South Eaton.	660	....	....	....	30.1	52	22	6	18	37.7	22.5	15.2	41	18	3	21
York.	York* (18 days).	385	....	30 68	29.35	30.6	53	8	5	6	39.8	21.4	18.4	38	18	8	9

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for February, 1892.*

County.	Station.	Elevation.	Barometer Reduced to Sea Level. Mean.	Barometer Reduced to Sea Level. Highest.	Barometer Reduced to Sea Level. Lowest.	Temperature. Mean.	Temperature. Maximum. Highest.	Temperature. Maximum. Date.	Temperature. Minimum. Lowest.	Temperature. Minimum. Date.	Temperature. Mean of maximum.	Temperature. Mean of minimum.	Temperature. Daily Range. Mean.	Temperature. Daily Range. Greatest.	Temperature. Daily Range. Date.	Temperature. Daily Range. Least.	Temperature. Daily Range. Date.
Allegheny.	Pittsburg.*	847	30.15	30.74	29.40	36.2	62	25	12	12	43.3	29.0	14.3	29	25	4	3
Berks,	Hamburg.	380	....	....	....	32.8	55	26	12	13	39.9	25.9	14.0	38	18	6	3,21
Berks,	Reading.	280	....	....	....	31.0	44	23	15	13	....	....	....	....	....	....	....
Blair,	Altoona.†	1,181	....	....	....	39.0	55	2,19	17	17	46.0	32.1	13.9	25	12	6	4
Blair,	Blue Knob.	2,500	....	....	....	27.2	45	2	-6	13	34.6	19.9	14.7	34	13	3	19
Blair,	Hollidaysburg,	947	....	....	....	32.6	57	10	1	6	40.6	22.6	18.0	40	18	8	4,21
Bradford.	Wysox,	718	30.18	30.69	29.35	29.1	48	26	8	13,17	35.5	22.2	13.3	38	18	4	3
Bradford,	Le Roy.	1,400	....	....	....	26.7	43	18,26	4	13,17	32.4	21.0	11.4	32	18	3	3
Bucks,	Hulmeville.*	....	30.13	30.68	29.25	33.5	53	8	14	6	40.2	26.9	13.3	35	18	2	21
Bucks,	Forks of Neshaminy (27 days).	....	....	....	....	34.9	....	....	....	....	....	....	....	....	....	....	....
Bucks,	Quakertown.	536	30.16	30.66	29.41	31.9	52	22	8	13	40.0	23.2	16.8	33	14	7	8
Cambria,	Johnstown.*	1,184	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cameron,	Emporium.	1,050	....	....	....	31.3	51	18	5	17	38.7	22.7	16.0	45	18	4	4
Carbon.	East Mauch Chunk.	550	....	....	....	31.7	53	22	9	13, 18	39.3	23.4	15.9	42	18	6	2, 21
Centre,	State College.	1,191	30.11	30.60	29.30	30.1	52	18	1	17	37.1	22.8	14.3	39	18	5	4
Chester,	West Chester.	455	30.13	30.64	29.24	33.2	52	8	12	13	40.2	27.0	13.2	32	18	5	21
Chester,	Coatesville.	380	....	....	....	32.8	55	8	11	6	42.3	25.3	17.0	39	18	7	21
Chester,	Kennett Square.*	275	....	....	....	32.0	....	....	....	....	....	....	....	....	....	....	....
Chester,	Phœnixville* (22 days).	183	30.07	30.72	29.36	32.8	54	8	14	13	40.4	25.1	15.3	33	18	6	21
Chester,	Westtown (27 days).	350	....	....	....	34.3	52	8	11	6	40.0	28.6	11.4	30	18	0.5	20
Clearfield,	Grampian Hills.	1,450	....	....	....	28.4	48	22,26	0	13	37.7	22.7	15.0	28	18	2	3,21
Clinton,	Lock Haven.	560	....	....	....	31.5	51	23	7	17	37.9	22.9	17.0	33	18	3	3
Crawford,	Meadville (20 days).	1,300	....	....	....	30.3	58	18	—9	13	39.7	19.4	20.3	30	13	5	19
Crawford,	Saegerstown,	....	....	....	....	29.0	53	24	—18	13	39.1	18.9	20.2	40	13	5	20
Cumberland,	Carlisle.	480	....	....	....	32.8	54	22,23	16	6,16	41.3	25.7	15.6	38	18	4	21
Dauphin.	Harrisburg.*	361	30.17	30.72	29.42	32.6	50	18	11	13	38.4	26.7	11.7	32	18	6	21
Delaware,	Swarthmore College.*	190	30.16	30.80	29.37	35.4	53	8	14	13	41.0	29.8	11.2	28	18	3	21
Erie,	Erie.*	681	30.10	30.71	29.29	29.0	50	24	8	13	35.8	22.8	13.0	33	18	2	21
Fayette.	Uniontown,	1,000	....	....	....	36.9	60	25	0	6	44.0	28.9	15.1	48	6	2	3
Fulton,	McConnellsburg.	875	....	....	....	34.0	60	1	2	6	43.2	25.7	17.5	37	6	4	11
Huntingdon,	Huntingdon.*	650	....	....	....	33.1	58	1	9	6,13	42.5	23.6	18.9	42	18	9	19
Lancaster.	Lancaster.*	413	30.15	30.72	29.24	33.3	59	1	13	17	40.7	26.0	14.7	32	1	7	21

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Lawrence,	Newcastle,	932	....	....	....	34.9	54	24,25	5	13	41.2	23.8	17.4	30	7	4	11
Lebanon,	Lebanon,	458	30.12	30.70	29.29	33.0	55	22	13	13	40.8	26.9	13.9	34	18	4	21
Lehigh,	Coopersburg,	520	....	....	....	32.5	54	22	11	13	41.6	26.2	15.4	32	18	4	3
Luzerne,	Drifton* (24 days),	1,655	30.10	30.65	29.39	27.2	48	26	4	29	35.1	19.5	15.6	32	18	3	20
Luzerne,	Wilkesbarre,*	575	....	....	....	33.3	57	29	11	13,17	42.6	24.1	18.5	32	29	11	9
Lycoming,	Williamsport* (27 days),	....	....	....	....	33.4	55	26	12	6,13	40.6	26.1	14.5	30	18	2	29
McKean,	Kane,*	....	....	....	....	27.6	49	18	2	17	34.4	20.8	13.6	32	18	4	4
McKean,	Smethport,	1,500	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Montgomery,	Pottstown,	150	....	....	....	34.2	51	8,26	12	13	40.6	27.9	12.7	32	18	5	3
Philadelphia,	Weather Bureau,*	117	30.16	30.70	29.37	35.2	54	8	14	13	41.1	29.3	11.8	29	18	3	21
Philadelphia,	Centennial Avenue,*	120	30.15	30.72	29.37	36.0	58	8	15	13	42.7	29.4	13.3	30	18	5	21
Philadelphia,	Haverford Street,*	104	....	....	....	34.0	52	8	14	13	39.4	23.7	10.7	28	18	4	21
Schuylkill,	Girardville,	1,000	30.10	30.66	29.10	30.3	50	22,23	9	13	38.2	24.1	14.1	36	18	8	20,21
Snyder,	Selinsgrove,	445	30.18	30.67	29.46	30.8	50	23	5	13	37.2	24.8	12.4	26	18	5	8,29
Somerset,	Somerset,	2,250	....	....	....	30.1	54	25	—15	6	36.9	23.6	14.3	37	6	5	12
Sullivan,	Eagles Mere,	2,060	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tioga,	Wellsboro,	1,327	30.14	30.60	29.27	26.9	50	1	2	16	34.4	20.8	13.6	39	18	4	29
Union,	Lewisburg,	450	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Warren,	Columbus,	1,410	....	....	....	29.8	57	25	—3	6,17	37.9	21.6	16.3	39	6	1	8
Wayne,	Dyberry,	1,100	....	....	....	25.6	48	22	—2	14,18	33.4	17.7	15.7	47	18	4	21
Wayne,	Honesdale,	1,000	....	....	....	27.6	48	26	1	18	35.0	20.2	14.8	40	18	3	3
Westmoreland,	Ligonier,	1,750	....	....	....	33.2	60	23	-6	6	44.6	22.8	21.8	44	6	4	18
Wyoming,	South Eaton,	660	....	....	....	30.1	52	22	6	18	37.7	22.5	15.2	41	18	3	21
York,	York* (18 days),	385	....	30 68	29.35	30.6	53	8	5	6	39.8	21.4	18.4	38	18	8	9

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station.	Relative humidity.	Dew point.	Precipitation. Total including melted snow.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of days. Clear.	Number of days. Fair.	Number of days. Cloudy.	Wind. Prevailing direction. 7 a. m.	Wind. Prevailing direction. 2 p. m.	Wind. Prevailing direction. 9 p. m.
Allegheny,	Pittsburg.*	72.5	27.2	1.85	...	15	4	8	17	NW	NW	NW
Berks,	Hamburg.	...	...	.44	...	5	3	14	12	NW	...	...
Berks,	Reading.	...	...	.54	...	...	...	...	...	...	...	...
Blair,	Altoona.†	74.6	31.7	1.57	...	8	...	...	...	...	...	...
Blair,	Blue Knob.	...	...	4.48	22.2	17	3	6	20	NW	NW	NW
Blair,	Hollidaysburg.	78.7	26.4	2.37	9.5	11	2	11	16	W	W	W
Bradford,	Wysox.	81.0	23.0	1.39	11.0	7	6	3	20	SE	SE	SE
Bradford,	Le Roy.	...	...	1.09	4.2	10	6	10	13	SW	SW	SW
Bucks,	Hulmeville.*	...	...	1.64	...	8	11	4	14	NE	...	NE
Bucks,	Forks of Neshaminy (27 days).	...	...	1.27	...	11	8	7	12	N	N	E
Bucks,	Quakertown.	84.7	28.0	1.35	2.0	12	5	12	12	NE	NW	NW
Cambria,	Johnstown.*	...	...	...	...	...	...	...	...	...	...	...
Cameron,	Emporium.	79.8	24.9	3.77	16.0	9	6	5	18	NW	SE	E
Carbon,	East Mauch Chunk.	...	...	1.14	2.5	8	11	5	13	NE	E	E
Centre,	State College.	86.3	26.3	1.73	9.0	6	3	10	16	W	W	W
Chester,	West Chester.	69.2	24.2	1.31	.5	13	12	3	14	NE	NE	NE
Chester,	Coatesville.	...	...	1.16	1.5	10	8	6	15	W	W	W
Chester,	Kennett Square.*	...	...	1.24	1.2	11	8	5	16	NW	...	NW
Chester,	Phœnixville* (22 days).	77.5	24.7	1.25	.1	10	7	3	19	NW	...	NW
Chester,	Westtown (27 days).	...	...	1.66	...	7	7	9	13	W	W	W
Clearfield,	Grampian Hills.	...	...	3.17	18.5	11	3	9	17	E	E	W
Clinton,	Lock Haven.	...	...	1.87	7.0	8	5	3	21	E	E	E
Crawford,	Meadville (20 days).	...	...	...	...	...	...	...	...	NW	...	S
Crawford,	Sægerstown.	...	...	4.24	16.0	15	5	8	16	SW	...	S
Cumberland,	Carlisle.	88.0	29.0	1.15	2.0	13	7	8	14	NE	W	NE
Dauphin,	Harrisburg.*	72.2	24.2	1.02	.7	12	7	7	15	E	E	E
Delaware,	Swarthmore College.*	83.6	27.5	.43	...	8	6	12	11	NE	...	NW
Erie,	Erie.*	84.6	24.5	2.39	...	16	5	5	19	NE	NE	NE
Fayette,	Uniontown.	...	...	2.62	...	9	6	16	7	SE	SW	SW
Fulton,	McConnellsburg.	75.4	26.9	1.47	10.5	4	6	7	16	NW	NW	NW
Huntingdon,	Huntingdon.*	...	...	1.86	7.5	9	7	8	14	W	...	W
Lancaster,	Lancaster.*	79.9	29.7	1.12	1.5	7	8	6	15	NW	...	NE

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Lawrence,	Newcastle,	...	...	2.36	1.7	9	6	5	18	SE	SE	SE
Lebanon,	Lebanon,	78.3	26.5	.95	.8	11	7	8	14	NE	NE	NE
Lehigh,	Coopersburg,	...	...	1.05	2.4	11	7	8	14	NE	NW	NE
Luzerne,	Drifton* (24 days),	86.0	24.0	.56	4.0	5	7	5	12	...	...	...
Luzerne,	Wilkesbarre,*	...	...	1.16	1.5	8	14	0	5	NW	...	NW
Lycoming,	Williamsport* (27 days),	...	...	2.85	8.3	7	9	8	10	NW	...	NW
McKean,	Kane,*	...	...	2.59	...	8	12	5	12	SE	...	...
McKean,	Smethport,	...	...	...	...	...	...	...	...	...	...	...
Montgomery,	Pottstown,	75.0	27.0	2.22	1.5	6	12	6	11	W	NE	NE
Philadelphia,	Weather Bureau,*	71.1	25.0	.98	...	9	8	9	12	NE	...	NE
Philadelphia,	Centennial Avenue,*	74.1	26.3	1.10	.1	9	7	10	12	NE	NE	NE
Philadelphia,	Haverford Street,*	...	...	.81	...	8	9	7	13	NE	...	NE
Schuylkill,	Girardville,	...	...	1.46	2.0	6	10	3	16	E	W	E
Snyder,	Selinsgrove,	76.8	26.0	.88	1.5	7	7	13	9	NW	SW	NW
Somerset,	Somerset,	84.1	30.1	2.95	20.5	9	4	4	21	SW	SW	SW
Sullivan,	Eagles Mere	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro,	78.2	24.5	2.21	7.7	10	6	9	14	SW	SW	W
Union,	Lewisburg,	...	...	...	...	...	...	...	...	...	...	...
Warren,	Columbus,	66.0	17.0	3.71	4.0	15	5	7	17	E	E	E
Wayne,	Dyberry,	...	...	1.29	9.0	8	6	7	16	NW	NW	NW
Wayne,	Honesdale,	...	...	2.02	13.0	7	...	...	...	...	...	...
Westmoreland,	Ligonier,	...	...	2.59	7.5	7	8	12	9	...	...	...
Wyoming,	South Eaton,	...	...	.91	4.0	8	5	8	16	NW	...	NW
York,	York* (18 days),	84.1	24.1	.10	...	8	7	7	4	NW	...	NW

Observations taken at 8 a. m. and 8 p. m. * Observations taken at 12 noon.

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PRECIPITATION FOR FEBRUARY, 1892.

DATE.	Altoona.	Blue Knob.	Browers' Lock.	Carlisle.	Coatesville.	Columbus.	Cooperburg.	Doylestown.	Drifton.	Dyberry.	Eagles Mere.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian Hills	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.
1						.10							.14								
2		.90		.04		.43	.02		.16	.24		.28	.36	.01		.13	.14	.02	.04	.05	.33
3	.03			.02	.01	.04							.11	.02					.01		
4		.15				.04											.03			.05	
5	.02	.30		.00	.05														.02	.10	
6																					
7	.14	.06	.12	.07	.07	.20	.03	.03				.10	.16	.10	.08		.10			.13	
8	.04	.18				.06	.01					.17	.07	.01	.02		.14		.01		
9		.25				.07			.10	.05			.06				.04				.02
10																				.10	
11		.20	.08		.10	.18	.19	.24	.10	.32		.22	.09	.14	.10	.38	.05	.07	.02		.18
12		.10				.20							.03				.16				
13																					
14		.32		.03	.18	.80	.07			.07		.35	.42	.06	.07	.13	.44	.11	.04	.35	.09
15	.45	.10	.07	.08		.06	.01	.06		.04		.32	.12		.03					.05	
16		.10							.10				.01								
17																					
18																					
19	.11	.42		.09	.03	.86	.01			.05		.71	.53	.01		.08	.74		.30	.45	
20	.35	.20	.10	.04	.02	.07	.13	.07	.10	.45		.29	.06	.18	.11	.06	.08	.05	.06	.04	.50
21			.14	.04	.06		.05	.28		.07				.29	.02				.04	.02	
22		.30		.01																	
23																					
24																					
25				.01									.03						.02		.03
26			.20		.14	.10	.07	.19					.07	.17	.16				.03		
27																					
28				.03																	
29	.43	.90		.60	.50	.50	.46	.30				1.33	.13	.28	.24	.68	1.25	.19	.43	1.07	.80
Total	1.57	4.48	.71	1.15	1.16	3.71	1.05	1.17	.56	1.29		3.77	2.39	1.27	.33	1.46	3.17	.44	1.02	2.37	2.04

* United States Weather Bureau stations.

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PRECIPITATION FOR FEBRUARY, 1892—*Continued.*

DATE	Hulmeville	Huntingdon.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	Le Roy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Newcastle.	Ottsville.	Philadelphia.*	Philadelphia.	Phœnixville.	Pittsburg.*	Point Pleasant.
1.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.06	...	...	...	...	.01	...
2.	...	.05	...	...	...	...	...	.04	.20	...	.18	.16	.30	...	...	...	...	...	...	.06	...
3.	...	...	...	...	.05	...	...	...	...	...	...	.09	...	...	.16	...	.02	.02	.03	.04	...
4.	...	...	...	...	...	...	...	...	...	...	.20	...	...	...	.04	...	...	...	...	...	...
5.	...	.10	...	...	...	.10	...	.01	...	...	...	...	...	.25	...	...	...	...	...	.10	...
6.	...	...	...	...	.03	...	...	...	...	...	.75	.02	...	...	...	...	...	...	...	...	...
7.	...	.20	...	...	.12	.05	.06	.08	.01	...	...	...	...	...	.30	...	.08	.08	.10	.23	.10
8	...	...	...	...	...	...	.02	.02	.02	...	...	...	...	...	...	...	.01	.01	.03	.05	.03
9.	...	...	...	...	...	...	...	...	.05	...	...	...	.08	...	.01	...	...	...	...	.01	...
10.	...	...	...	.35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11.	.10	.15	...	.30	.10	.05	.12	.06	.02	...	...	...	.16	...	.04	.25	.07	.07	.11	.03	...
12.	...	...	...	.20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.01	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	...	.25	...	.70	.02	.10	...	.06	.17	...	...	.05	...	.20	.59	...	.03	.02	.07	.25	.25
15.	...	.15	...	...	.08	...	.08	...	...	...	...	.50	.15	...	...	.35	...	...	...	.04	.05
16.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19.	...	.21	...	.78	...	.03	...	.10	.05	...	.45	.20	...	.22	...	...	...	...	...	.43	...
20.	...	.15	...	.02	.08	.10	.13	.02	.25	...	.11	.29	.24	...	.77	.15	.20	.16	.14	.14	.21
21	...	...	...	...	.04	...	.10	...	.02	...	...	.06	.03	...	...	.14	.15	.17	.17	...	.20
22.	.82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.02	...	...
23.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25.	...	...	...	...	.02	.06	...	.04	...	...	...	...	...	...	...	...	...	...	...	...	...
26.	...	...	...	...	.24	.01	...	.03	...	...	.11	...	.05	...	.39	.12	.16	.19	...	.27	.15
27.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.21	...	...
28.	...	...	...	.22	...	...	...	...	...	...	.84	...	...	...	...	...	...	...	...	...	...
29.	.72	.60	...	.02	.46	.62	.24	.49	.30	...	...	...	.13	.80	...	.10	.26	.38	.37	.18	.30
Total,	1.64	1.86	...	2.50	1.24	1.12	.75	.95	1.00	...	2.59	1.87	1.14	1.47	2.36	1.11	.98	1.10	1.25	1.85	9

* United States Weather Bureau stations.

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PRECIPITATION FOR FEBRUARY, 1892—*Continued.*

DATE.	Pottstown.	Quakertown.	Reading.	Sægerstown.	Seisholtzville.	Selinsgrove	Smethport.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wysox.	York.
1.			.01	.07						.08									.15	
2.		.01		.37	.17	.24		.04	.06	.15	.14			.96			.15	.21	.12	
3.		.03	.01	.10								.01			.03		.10			
4.				.10					.16				.10	.05			.05			
5.			.01						.55				.50		.05					
6.																				
7.	.10	.06	.05	.22		.05			.10		.14	.01	.34	.05	.08	.11		.09		.08
8.		.05						.10					.06							
9.				.10					.08			.01		.04			.03			
10.				.50																
11.	.12	.20	.06	.80	.22			.19	.30	.20		.14	.06	.04	.09	.13	.24	.08	.07	.01
12.																				
13.																				
14.	.10	.09	.08	.70	.08	.25		.08	.15	.05			.40	.08	.05	.06		.31	.03	.01
15.		.01	.06	.13	.04			.02		.07	.20			.02	.04					
16.																				
17.																				
18.																				
19.		.06	.01	.70		.13		.01			.27		.25	.20	.02	.07		.38	.20	
20.	.18	.19	.08	.08	.22	.11		.17	.10	.26	.11	.05		.12	.07	.02	.51	.02	.08	
21.		.10			.08	.04		.25		.05		.06			.15		.05			
22.												.01								
23.																				
24.																				
25.				.08											.08	.15	.08			
26.	.12	.19	.08	.20				.14				.14	.05		.19					
27.															.08					
28.			.01																	
29.	1.60	.36	.23	.19	.65	.06		.25	1.45	.10	.87		.86	.65	.48	1.12		1.74	.74	
Total.	2.22	1.35	0.54	4.24	1.46	.88		1.25	1.95	.91	1.73	.43	2.62	2.21	1.31	1.66	1.16	2.83	1.39	.10

* United States Weather Bureau Stations

FOR MARCH, 1892.

General Remarks.

The following comparative statement of the mean temperature for March shows that the mean for March, 1892, is lower than in any year except 1888. The normal temperature for the whole state is very nearly 36 degrees. The month was cold, wet and generally unpleasant. About the usual amount of snow fell and was fairly well distributed. In the northern counties and in elevated regions the snow remained on the ground during greater part of the month. In other sections it did not cover the ground for sufficient length of time to protect grain from effects of freezing and thawing weather. However, no great damage to crops has been reported. The rainfall was above the average, and it, too, was well distributed.

Mean temperature and departure from normal:

March, 1888, mean 31°.1, 4 to 5° below normal.
March, 1889, mean 38°.9, 2 to 3° above normal.
March, 1890, mean 33°.4, 2°.5 below normal.
March, 1891, mean 34°.1, 2°.0 below normal.
March, 1892, mean 32°.0, 4°.0 below normal.

Mean rainfall:

March, 1888, 3.55 inches.
March, 1889, 2.90 inches.
March, 1890, 5.15 inches.
March, 1891, 5.10 inches.
March, 1892, 4.14 inches.

Temperature.

The mean temperature for March, 1892, was 32°.0, which is nearly 4°.0 below the normal, and 2°.1 below the corresponding month of 1891.

The mean of the daily maxima and minima temperatures 40°.1 and 23°.5 give an average daily range of 16°.6, and a monthly mean of 31°.8.

Highest monthly mean, 37°.8 at Altoona.

Lowest monthly mean, 25°.1 at Wellsboro.

Highest temperature recorded during the month, 66°.0 on the 26th at Meadville.

Lowest temperature, minus 4° on the 21st at Wellsboro.

Greatest local monthly range, 64° at Meadville.

Least local monthly range, 40° at Lancaster and Philadelphia.

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Greatest daily range, 48° at Columbus on the 21st.

Least daily range, 1° at Swarthmore on the 2d.

From January 1, 1892, to March 31, 1892, the deficiency in temperature at Philadelphia was 143°, at Erie 154°, and at Pittsburg 124°.

The warmest days of the month were the 25th and 26th. The coldest were the 21st and 22d.

Barometer.

The mean pressure for the month, 30.04, is about .02 above the normal. At the United States weather bureau stations, the highest observed was 30.57 at Pittsburg, on the 21st, and the lowest 29.33 at Harrisburg, on the 8th.

Precipitation.

The average precipitation, 4.14 inches for the month, is an excess of about 1.00 inch. The largest totals in inches (including melted snow) were, Lancaster, 6.61; Wilkesbarre, 6.46; Kennett Square, 5.00; West Chester, 5.89; Phœnixville, 5.70, and Lewisburg, 5.53.

The least were Wysox, 2.04; Newcastle, 2.22; Drifton, 2.14; Erie, 2.20; Sægertown, 2.27, and Pittsburg, 2.29.

The largest monthly snowfall totals in inches were Girardville, 36.5; Blue Knob, 35.5; Huntingdon, 32.5; LeRoy, 32.2; Lock Haven, 29.5, and Selinsgrove, 29.4.

Wind and Weather.

The prevailing wind was from the northwest.

Average number: Rainy days, 12; clear days, 11; fair days, 7; cloudy days, 13.

Verification of Weather Forecasts.

Percentage of local verifications of weather and temperature signals as reported by displaymen: Weather, 89 per cent.; temperature, 89 per cent.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for March, 1892.*

Counties.	Stations.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean maximum.	Mean minimum.	Daily Range. Mean.	Greatest.	Date.	Least	Date.
Allegheny	Pittsburg.*	847	30.08	30.57	29.36	35.4	61	26	13	11	42.7	27.1	15.6	31	22	7	17
Berks	Hamburg	380				33.4	60	25	12	22	41.3	25.5	15.8	32	25	6	1, 2
Berks	Reading	290				34.0											
Blair	Altoona.†	1,181				37.8	61	26, 27	17	14	46.0	29.7	16.3	27	20	9	18
Blair	Blue Knob	2,500				27.4	53	25	5	21	33.6	21.4	12.2	29	21	8	31
Blair	Hollidaysburg	947				31.6	62	25	10	11	40.2	23.0	17.2	37	25	7	17
Bradford	Wysox	718	30.07	30.54	29.40	27.1	55	26	—1	22	35.7	18.3	17.4	37	22	7	27
Bradford	Le Roy	1,400				26.3	55	26	5	15	33.7	18.9	14.8	29	22	6	5, 31
Bucks	Hulmeville.*		30.01	30.51	29.27	34.3	60	10	15	14	42.5	26.1	16.4	31	10	7	5, 27
Bucks	Forks of Neshaminy					35.0											
Bucks	Quakertown	536	30.08	30.58	29.39	31.2	57	25		22	40.7	21.2	19.5	37	22	7	2
Cambria	Johnstown (27 days).*	1,184				34.5	64	25	10	21	42.0	27.0	15.0	36	25	2	15
Cameron	Emporium	1,060	30.04	30.54	29.46	31.2	55	25	2	21	38.9	21.4	17.5	32	21, 25	8	5, 18
Carbon	East Mauch Chunk	550				31.4	58	25	7	22	39.6	22.8	16.8	32	25	3	2
Centre	State College	1,191	30.01	30.46	29.31	29.0	55	25	9	21	36.7	21.5	15.2	24	25	5	17
Chester	West Chester	455	30.02	30.44	29.31	33.4	58	25	14	21	41.4	26.4	15.0	29	12	6	8
Chester	Coatesville	380				33.2	60	25	8	22	42.9	24.1	18.8	35	22	7	3
Chester	Kennett Square.*	275				32.7											
Chester	Phœnixville.*	183	30.02	30.49	29.33	33.7	58	25	8	22	41.9	25.6	16.3	32	27	5	2
Chester	Westtown (28 days)	350				35.4	55	26	12	22	42.2	28.6	13.6	29	2	5	18
Clearfield	Grampian Hills	1,450				27.6	54	25		21	35.3	21.2	14.1	34	25	2	27
Clinton	Lock Haven	560				32.5	60	25	4	21	39.8	22.1	17.7	32	21	5	10
Crawford	Meadville	1,300				32.2	66	26	2	21	42.3	22.1	20.2	38	21	7	3
Crawford	Saegertown					29.3	62	26	2	15	38.7	20.0	18.7	37	21	5	5
Cumberland	Carlisle	480				33.5	63	25	12	22	41.5	25.3	16.2	36	25	3	30
Dauphin	Harrisburg.*	361	30.04	30.51	29.33	33.0	57	25	16	15	39.4	26.5	12.9	26	12	4	34
Delaware	Swarthmore College.*	190	30.01	30.49	29.32	34.6	59	26	14	22	42.5	26.8	15.7	30	12	1	2
Erie	Erie.*	681	30.04	30.52	29.34	30.0	54	26	11	21	35.6	23.5	12.1	26	22	2	20
Fayette	Uniontown	1,000				36.7	62	25	10	11	44.5	28.9	15.6	39	12	4	13
Fulton	McConnellsburg (30 days)	875				34.5	62	25	15	11	44.2	25.9	18.3	35	25	4	17
Huntingdon	Huntingdon.*	650				31.6	61	25	9	21	40.5	22.8	17.7	41	25	6	17
Lancaster	Lancaster.*	418	30.02	30.51	29.16	32.3	52	23	12	21	40.5	24.2	16.3	30	12	4	1
Lawrence	Newcastle	932				34.0	65	26	8	21	41.8	22.6	19.2	35	25	8	17, 18
Lebanon	Lebanon	458	30.02	33.51	29.34	33.4	59	25	14	15	41.9	26.1	15.8	30	25	6	8

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Elevation.	BAROMETER REDUCED TO SEA LEVEL. Mean.	Highest.	Lowest.	TEMPERATURE. Mean.	MAXIMUM. Highest.	Date.	MINIMUM. Lowest.	Date.	Mean of maximum.	Mean of minimum.	DAILY RANGE. Mean.	Greatest.	Date.	Least.	Date.
Lehigh,	Coopersburg,	†520	....	....	....	32.7	57	25	12	22	42.1	25.5	16.6	27	22, 30	5	8
Luzerne,	Drifton (27 days),*	1,655	30.08	30.56	29.32	27.0	58	25	5	22	35.5	19.8	15.7	27	21	5	9
Luzerne,	Wilkesbarre,*	575	....	....	....	32.4	60	25	10	21	42.1	22.7	19.4	32	25	8	5
Lycoming,	Williamsport,*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
McKean,	Kane,*	....	....	....	....	26.5	55	25	7	11	34.0	18.9	15.1	30	22	4	8
McKean,	Smethport,	1,500	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Montgomery,	Pottstown,	150	....	....	....	34.8	60	25	11	22	41.9	27.7	14.2	28	25	3	2
Philadelphia,	Weather Bureau,*	117	30.02	30.51	29.34	35.8	59	25	19	21	42.5	29.1	13.4	28	12	3	2
Philadelphia,	1527 Centennial avenue,*	120	30.02	30.52	29.33	37.3	61	25	20	21	45.0	29.6	15.4	27	12, 25	5	2
Philadelphia,	3301 Haverford street,*	104	....	....	....	35.2	59	25	19	21	42.7	27.7	18.0	27	25	5	1, 2
Schuylkill,	Girardville,	1,000	30.00	30.48	29.36	30.2	58	25	11	22	38.3	22.6	15.7	29	30	8	2, 5
Snyder,	Selinsgrove,	445	30.07	30.43	29.54	32.5	50	25	9	21	40.2	25.2	15.0	31	21	6	4, 30
Somerset,	Somerset,	2,250	....	....	....	29.2	60	25	4	21	38.6	21.5	17.1	36	21	5	18
Sullivan,	Eaglesmere,	2,060	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tioga,	Wellsboro,	1,327	....	30.49	29.50	25.1	54	26	—4	21	35.2	19.6	15.6	32	24	4	6
Union,	Lewisburg,	450	30.02	30.37	29.50	31.1	59	25	8	22	39.8	22.4	17.4	34	25	5	8
Warren,	Columbus,	1,410	....	....	....	27.8	64	26	—10	21	36.7	18.9	17.8	48	21	2	23
Wayne,	Dyberry,	1,100	....	....	....	26.3	56	26	—3	22	35.9	18.2	17.7	43	22	3	1
Wayne,	Honesdale,	1,000	....	....	....	28.7	55	26	....	22	38.0	19.5	18.5	42	22	8	9
Westmoreland,	Ligonier,	1,750	....	....	....	33.6	62	25	8	20	43.5	23.8	19.7	37	25	6	17
Wyoming,	South Eaton,*	660	....	....	....	29.0	55	26	10	15, 18	36.7	21.3	15.4	27	7, 25	8	8, 27
York,	York,*	385	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

* Observations taken 8 a. m. and 8 p. m.

† Observations taken 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station	Dew point.	Relative humidity.	Precipitation. Total.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of days. Clear.	Number of days. Fair.	Number of days. Cloudy.	Wind. Prevailing direction. 7 a. m.	Wind. Prevailing direction. 2 p. m.	Wind. Prevailing direction. 9 p. m.
Allegheny	Pittsburg,*	70.2	24.8	2.29	...	15	8	8	15	NW	...	NW
Berks	Hamburg,	...	...	3.81	...	9	3	19	9	NW	NW	NW
Berks	Reading	...	...	4.93	...	17	...	...	...	...	...	...
Blair,	Altoona.†	71.9	30.0	2.37	...	11	...	...	...	...	...	...
Blair,	Blue Knob.	...	...	4.47	35.5	15	4	7	20	NW	NW	NW
Blair,	Hollidaysburg.	80.0	26.0	4.89	19.2	14	9	7	15	W	W	W
Bradford,	Wysox,	80.0	21.4	2.04	15.0	9	12	4	15	W	W	W
Bradford,	Le Roy,	...	...	4.25	32.2	11	7	8	16	SW	NE	NW
Bucks,	Hulmeville.*	...	...	3.24	...	4	12	3	16	NW	...	NW
Bucks,	Forks of Neshaminy,	...	...	4.18	...	9	11	13	7	W	W	W
Bucks,	Quakertown,	83.0	26.6	5.30	21.0	10	11	9	11	NW	NW	NW
Cambria,	Johnstown (27 days).*	...	...	3.57	7.5	15	6	7	14	S	...	S
Cameron,	Emporium,	77.5	24.3	3.87	19.5	9	6	8	17	E	W	NW
Carbon,	East Mauch Chunk.	...	...	5.17	11.7	11	13	6	12	W	W	W
Centre,	State College.	82.6	24.0	3.78	23.6	14	6	7	18	W	W	W
Chester,	West Chester,	64.0	23.0	5.89	17.7	17	16	1	14	NW	NW	NW
Chester,	Coatesville,	...	...	5.30	20.8	14	13	4	14	W	W	W
Chester,	Kennett Square,	...	...	5.90	14.5	14	15	4	12	NW	...	NW
Chester,	Phœnixville,*	73.8	22.5	5.70	13.7	16	13	3	15	NW	...	NW
Chester,	Westtown (28 days).	...	...	3.83	...	8	10	7	11	...	...	...
Clearfield,	Grampian Hills,	...	...	3.61	24.0	12	4	11	16	W	W	W
Clinton,	Lock Haven,	...	...	4.83	29.5	15	6	5	20	W	W	W
Crawford,	Meadville.	...	...	...	...	...	10	7	14	N	W	...
Crawford,	Saegertown.	...	...	2.27	9.0	12	6	6	19	NW	...	NW
Cumberland,	Carlisle,	83.9	28.4	4.19	19.3	12	11	9	11	NE	NE	N
Dauphin,	Harrisburg,*	68.2	23.2	4.81	13.5	15	9	10	12	NW	...	NW
Delaware,	Swarthmore College.*	83.1	28.7	4.84	13.5	5	12	8	11	NW	...	NW
Erie,	Erie,*	81.2	23.2	2.20	...	20	12	3	16	NE	...	NE
Fayette,	Uniontown,	...	...	2.49	...	9	10	15	6	NW	NW	NW
Fulton,	McConnellsburg (30 days).	74.0	26.8	3.49	...	7	10	7	13	W	NW	W
Huntingdon,	Huntingdon,*	...	...	5.11	32.5	14	10	8	13	W	...	W
Lancaster,	Lancaster,*	77.1	30.7	6.61	18.7	14	11	9	11	SW	...	NW
Lawrence,	Newcastle,	...	...	2.12	10.5	10	5	10	16	NW	NW	NW
Lebanon,	Lebanon.	77.4	26.4	4.91	19.2	14	14	5	12	NE	NE	NW

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Dew point.	Relative humidity.	PRECIPITATION. Total.	PRECIPITATION. Snow.	PRECIPITATION. Number of days with rain.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	WIND. PREVAILING DIRECTION. 2 p. m.	WIND. PREVAILING DIRECTION. 9 p. m.
Lehigh,	Coopersburgh,	...	...	4.77	11.4	9	11	7	13	NW	NW	NW
Luzerne,	Drifton (27 days).*	82.0	24.0	2.14	15.0	5	12	4	11	...	...	...
Luzerne,	Wilkesbarre.*	...	...	6.46	28.0	8	14	1	16	SW	...	SW
Lycoming,	Williamsport.*	...	...	...	...	...	...	...	...	...	...	...
McKean,	Kane.*	...	...	3.87	...	15	20	5	6	NW	...	...
McKean,	Smethport,	...	...	...	...	...	...	...	...	...	...	...
Montgomery,	Pottstown,	71.0	25.5	3.73	11.5	9	15	4	12	W	W	W
Philadelphia,	Weather Bureau.*	64.6	23.2	4.32	8.5	15	11	8	12	NW	...	NW
Philadelphia,	1,527 Centennial avenue,*	70.4	25.4	5.35	9.5	14	13	9	9	NW	NW	NW
Philadelphia,	3,301 Haverford street.*	73.4	26.0	4.65	9.2	10	15	3	13	NW	...	NW
Schuylkill,	Girardville,	...	...	7.60	36.5	13	12	7	12	W	W	W
Snyder,	Selinsgrove,	85.5	28.1	3.92	29.4	11	4	16	11	NW	NW	NW
Somerset,	Somerset,	98.0	25.6	3.85	13.2	9	3	5	23	NW	NW	NW
Sullivan,	Eaglesmere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro',	77.9	19.3	4.56	28.0	10	13	3	15	...	N	N
Union,	Lewisburgh,	79.7	26.0	5.58	14.5	11	11	7	13	W	...	W
Warren,	Columbus,	68.0	18.5	1.63	...	13	6	8	17	SW	SW	SW
Wayne,	Dyberry,	...	...	4.14	26.5	11	9	10	12	NW	NW	NW
Wayne,	Honesdale,	...	...	2.88	17.0	9	...	...	...	...	...	...
Westmoreland,	Ligonier,	...	...	2.97	11.0	11	8	17	6	...	...	...
Wyoming,	South Eaton,*	...	...	4.53	23.0	12	14	3	14	NW	...	NW
York,	York.*	...	...	...	...	...	...	...	...	...	...	...

* Observations taken 8 a. m. and 8 p. m.

† Observations taken 12 noon.

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PRECIPITATION FOR MARCH, 1892

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Eagles Mere.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian Hills.	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.
1.	.95	1.30	2.19	1.64	.50	...	1.84	.98	1.20	1.65	...	.80	.06	1.30	1.63	2.16	.00	1.26	1.21	2.26	1.13
2.	...	...	.08	.14	.12	...	.04	.53	...	.09	...	...	...	.04	.08	.09	...	.14	.02	...	.03
3.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4.	...	.01	...	...	...	.13	...	...	...	...	...	...	.04	...	...	...	...	...	...	.03	...
5.	.14	.40	...	.16	...	...	...	...	...	...	...	...	.01	...	...	...	.20	...	.20	.32	...
6.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8.	.35	.50	1.06	.84	1.10	.20	1.05	.91	.64	.50	...	.78	.29	1.02	.92	.78	.58	.80	.94	.58	.52
9.	.03	.15	...	.05	...	.01	...	...	...	...	...	...	.02	...	...	.08	...	...	...	...	...
10.	...	.25	.08	.15	.15	.18	.07	.14	.20	.60	...	.26	.27	.10	.10	1.40	.21	.28	.03	.06	.32
11.	...	...	...	...	...	.02	...	...	...	.15	...	...	.05	...	...	...	...	...	.14	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	.03	...	...	...	...	...	...	...	...
13.	...	.15	.08	...	.10	...	...	...	...	...	...	...	.07	.03	...	...	.08	...	...	.04	...
14.	...	...	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...
15.	...	...	...	...	...	.08	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	...
16.	...	...	.16	.02	.40	...	.06	.16	...	...	...	...	...	.13	.15	...	...	...	.03	...	...
17.	...	.20	...	...	.25	...	.07	...	.05	.04	...	.03	.02	...	.01	.42	...	...	.07	.21	.45
18.	.14	.45	.67	.70	.55	.12	.66	.27	.05	.39	...	.20	.22	.03	.61	.64	.26	.56	.30	.12	.06
19.	...	.20	...	.16	.03	.10	...	...	...	.12	...	...	.09	...	.02	.11	.16	...	...	.06	...
20.	...	.10	...	...	...	.04	...	...	...	...	...	...	.04	...	...	...	.04	...	...	...	...
21.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22.	.14	...	...	.12	.09	.19	...	...	...	.05	...	.12	.08	...	...	.04	.22	.04	.04	.23	.07
23.	.06	.31	.08	.16	.09	.30	.12	.07	...	.43	...	.60	.51	.06	.14	.35	.51	.15	.21	.15	.18
24.	.02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26.	...	...	...	...	.08	...	...	...	...	...	...	...	...	...	...	.06	...	...	.05	.01	...
27.	.48	.35	1.10	...	1.11	.17	.87	.36	...	.12	...	.78	.30	.87	1.05	1.16	.68	.44	1.10	.71	.12
28.	.04	.05	...	...	...	...	...	...	...	...	...	...	.02	...	...	...	...	...	.01	...	...
29.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31.	.02	.05	.04	.06	.73	.00	...	...	...	...	...	.26	.05	...	...	.35	.07	.19	.46	.14	...
Total.	2.37	4.47	5.49	4.19	5.30	1.63	4.77	3.32	2.14	4.14	...	3.87	2.20	4.18	4.66	7.60	3.61	3.81	4.81	4.89	2.88

* United States Weather Bureau stations

PRECIPITATION FOR MARCH, 1892—*Continued.*

DATE	Hulmeville.	Huntingdon.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Landale.	Lebanon.	Le Roy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Newcastle.	Ottsville.	Philadelphia.*	Philadelphia.	Phœnixville.	Pittsburg.*	Point Pleasant.
1.	. .	1.92	.53	.10	70	.30	1.68	.47	2.00	1.00	.30	1.70	1.96	. . .	.12	1.00	1.00	1.46	1.85	.23	1.20
2.	. . .	.08	.01	. . .	.15	.25	.02	.05	. . .	.10	. . .	.40	.16	. . .	. . .	.35	.07	.02	.06	. . .	. . .
3.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.60	. . .	. . .	. . .	. . .	. . .	. . .	. . .
4.	. . .	. . .	. . .	.10	. . .	. . .	. . .	. . .	. . .	. . .	.25	.02	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.03	. . .
5.	. . .	.28	.55	. . .	. . .	.05	. . .	.06	. . .	.17	.55	.01	. . .	.31	.33	. . .	.01	.01	.03	.30	. . .
6.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
7.	. . .	. . .	. . .	.14	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
8.	1.72	.44	.62	.36	1.30	1.44	1.00	1.11	.35	.69	.38	.50	.88	.62	.25	.96	1.04	1.34	.99	.34	.82
9.	. . .	.06	.07	.04	.02	.06	.01	.04	. . .	1.50	.12	.03	.04	.12	. . .	. . .	.01	. . .	. . .	.03	.18
10.	. . .	.18	.10	.50	.06	.38	.01	.31	.59	.20	.10	.15	.20	. . .	. . .	.07	.04	.07	.11	.14	. . .
11.	. . .	. . .	. . .	.10	. . .	. . .	. . .	. . .	.10	. . .	. . .	. . .	.04	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
12.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
13.	. . .	.07	. . .	. . .	.04	.05	. . .	. . .	. . .	. . .	. . .	.10	. . .	. . .	.04	. . .	.04	.02	.02	. . .	. . .
14.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
15.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
16.	.20	. . .	. . .	. . .	.24	.30	.22	.05	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.10	.22	.20	.40	. . .	.02
17.	. . .	20	.11	.20	.30	.25	.12	.11	.10	.10	. . .	.20	. . .	. . .	. . .	. . .	.12	.09	.11	.08	. . .
18.	.40	.35	.39	.20	.78	.80	.83	.65	.25	.05	. . .	.25	.46	.30	. . .	.30	.89	.95	.75	.29	.78
19.	. . .	. . .	.15	.60	.05	. . .	.05	. . .	.07	. . .	.35	.15	.08	. . .	.32	.05	.04	.01	.02	.05	.01
20.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.01	. . .	. . .	. . .	. . .	.04	. . .
21.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.20	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.10	. . .
22.	. . .	.20	.12	.64	.06	. . .	. . .	.04	.02	.25	. . .	. . .	.11	. . .	. . .	. . .	.01	.01	.02	.14	. . .
23.	. . .	.22	.15	.02	.24	.20	.03	.19	.10	.45	.23	.65	.32	. . .	.32	.20	.16	.16	.09	.11	.15
24.	. . .	. . .	.04	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
25.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
26.	. . .	. . .	. . .	.48	. . .	.05	. . .	.05	. . .	. . .	. . .	.01	. . .	. . .	. . .	. . .	.03	.01	.01	. . .	. . .
27.	.92	.71	.62	.26	1.46	1.88	.92	1.24	.62	1.02	.45	.50	.92	1.20	.63	.80	.64	1.00	1.16	.46	.67
28.	. . .	.10	.05	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.04	. . .	. . .	. . .	.02	. . .	. . .	. . .	.01	. . .	. . .
29.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
30.	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	.02	. . .
31.	. . .	.30	.06	.13	.50	.60	. . .	.54	.05	. . .	. . .	.16	. . .	.34	.08	. . .	. . .	. . .	.07	.03	. . .
Total.	3.24	5.11	3.57	3.87	5.90	6.61	4.89	4.91	4.25	5.53	2.97	4.83	5.17	3.49	2.12	3.83	4.32	5.35	5.70	2.29	3.83

* United States Weather Bureau stations.

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PRECIPITATION FOR MARCH, 1892—*Continued.*

DATE.	Pottstown.	Quakertown.	Reading.	Segertown.	Seisholtzville.	Selinsgrove.	Smethport.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wysox.	York.
1.	.20	1.98	.80	...	1.73	1.60	...	1.00	.25	1.62	1.21	1.42	.06	1.75	1.20	.40	...	...	.63	...
2.	...	.30	.11	...	.16	.80	...	.08	...	.52	.06	...	...	.20	.17	...	1.50	...	...	...
3.	...	...	...	...	...	...	...	...	...	.10	...	...	...	...	...	...	...	...	...	...
4.	...	...	...	.12	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...
5.	...	...	.01	...	...	...	...	...	.30	...	.15	...	.55	...	.05	...	...	...	...	...
6.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8.	.97	.96	1.40	.26	1.31	.76	...	.87	1.30	.59	.63	1.43	.46	.50	1.15	1.04	1.02	...	.33	...
9.	...	.03	.01	...	...	1.30	...	...	...	...	.11	...	.19	...	.04	...	.15	...	...	...
10.	.07	.18	.18	.25	.15	.15	...	.09	.07	.37	.13	...	.25	.25	.05	...	.88	...	.31	...
11.	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	...	...	.01	.02	...	...	...	...	.08	...	...	...	...	...	.06	.50	...	...	...	...
14.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16.	.18	.10	.03	...	...	...	...	.14	...	...	...	...	...	...	.28	...	...	...	...	...
17.	...	.15	.01	.03	...	...	...	.04	.50	...	.12	...	.10	.10	.30	.40	...	...	.20	...
18.	.92	.51	.95	.05	.70	.50	...	.57	.45	.52	.19	...	.22	.25	.84	...	.90	...	.12	...
19.	.05	...	.03	.15	...	...	...	.03	.55	.11	...	...	.04	.10	.06	...	...	...	...	...
20.	...	...	.01	.03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22.	...	...	.01	.20	...	.03	...	...	...	.05	.18	...	...	...	.09	...	.96	...	.07	...
23.	.18	.22	.21	.47	.31	.10	...	.12	.40	.15	.17	.95	...	...	.14	.50	...	...	...	...
24.	...	...	...	...	...	...	...	...	...	.03	...	...	...	...	...	.30	...	...	...	...
25.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26.	...	...	.01	...	...	.04	...	...	...	...	...	...	...	.04	.08	...	1.00	...	.12	...
27.	1.10	.87	.75	.64	.97	.10	...	.67	...	.19	.67	1.02	.62	1.35	1.03	.50	...	...	.21	...
28.	...	...	...	...	...	...	...	...	...	.27	.05	...	...	...	.03	...	...	...	...	...
29.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.05	...	...	...
31.	.06	...	.40	...	...	.04	...	...	...	...	.10	.01	...	.02	.32	.19	...	...	.05	...
Total.	3.73	5.30	4.93	2.27	5.33	3.92	...	3.56	3.85	4.53	6.78	4.84	2.49	4.56	5.89	3.83	6.46	...	2.64	...

H. L. B

FOR APRIL, 1892.

General Remarks.

The normal temperature for Pennsylvania for April was about 46°.5. Though the mean temperature for April, 1892, was slightly above the normal, there was much cool weather and this considerably delayed the growth of vegetation.

This check was beneficial as it prevented too early development of blossoms and leaves and served to harden them, thus preventing injury from frost.

Except in the mountains, but little snow fell, and that which fell remained on the ground only a short while.

The month was without extremes either of temperature or precipitation. The rainfall was quite evenly distributed and no severe storms occurred.

Mean temperatures and departure from normal:

April, 1888, mean, 46°.5, normal.
April, 1889, mean, 48°.7, 2°.2 above normal.
April, 1890, mean, 48°.7, 2°.2 above normal
April, 1891, mean, 49°.8, 3°.3 above normal
April, 1892, mean, 47°.0, 0°.5 above normal.

Mean precipitation:

April, 1888, 2.52 inches.
April, 1889, 4.50 inches.
April, 1890, 3.46 inches.
April, 1891, 2.08 inches.
April, 1892, 2.04 inches.

Temperature.

The mean temperature for April, 1892, was 47°.0, which is about the normal, and 2°.8 below the corresponding month of 1891.

The mean of the daily maxima and minima temperatures, 57°.2 and 36°.6, gives an average daily range of 20°.6, and a monthly mean of 46°.9.

Highest monthly mean, 52°.4, at Philadelphia, Centennial avenue.

Lowest monthly mean, 42°.1, at Kane.

Highest temperature recorded during the month, 85°, on the 4th, at Coatesville and York.

Lowest temperature, 14°.0, on the 12th, at Columbus.

Greatest local monthly range, 63°.0, at Coatesville and Smethport.

Least local monthly range, 48°.0, at Philadelphia.

Greatest daily range, 48°.0, at Wysox, on the 3d.

Least daily range, 1°.0, at Blue Knob, on the 22d.

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From January 1, 1892, to April 30, 1892, the deficiency in temperature at Philadelphia was 123°, at Erie 140°, and at Pittsburg 144°.

The warmest days of the month were the 4th and 5th. The coldest were the 10th, 12th and 25th.

Barometer.

The mean pressure for the month, 30.09, is about .09 above the normal. At the United States weather bureau stations the highest observed was 30.54, at Erie on the 25th, and the lowest 29.64, at Philadelphia on the 8th.

Precipitation.

The average precipitation, 2.04 inches for the month, is a deficiency of about three-quarters of an inch. The largest totals in inches (including melted snow) were, Somerset, 4.43; Johnstown, 3.55; Blue Knob, 3.35; Kennett Square, 3.31, and Uniontown, 3.23.

The least were, Wellsboro, 0.01; Wysox, 0.91, and LeRoy, 0.96.

The largest monthly snowfall totals in inches were, Blue Knob, 12.0; Grampian Hills, 6.0, and State College, 5.5

No snow reported on ground at end of month.

Wind and Weather.

The prevailing wind was from the northwest.

Average number: Rainy days, 10; clear days, 10; fair days, 10: cloudy days, 10.

Verification of Weather Forecasts.

Percentage of local verification of weather and temperature as reported by displaymen: Weather, 85 per cent.; temperature, 89 per cent.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for April, 1892.*

County.	Station	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean maximum.	Mean minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg,*	847	30.09	30.45	29.72	50.2	79	4	27	12	59.2	41.2	18.0	33	27	7	14
Berks	Hamburg	380	....	....	....	48.7	83	4	26	17	59.2	38.2	21.0	36	26	4	29
Berks	Reading,*	280	....	....	....	47.8	....	....	....	....	....	....	....	....	....	....	....
Blair	Altoona,†	1,181	....	....	....	52.1	79	5	29	25	60.5	43.7	17.8	33	7	8	3
Blair	Blue Knob	2,500	....	....	....	43.9	74	4	20	9	51.3	36.6	14.7	31	30	1	22
Blair	Hollidaysburg	947	....	....	....	46.8	82	4	20	12	59.4	34.5	24.9	44	27	7	14
Bradford	Wysox	718	30.09	30.56	29.64	44.8	79	4	21	10,17	55.0	31.8	23.2	48	3	6	21
Bradford	Le Roy	1,400	....	....	....	42.6	74	4	19	25	51.7	33.7	18.0	33	27	7	21
Bucks	Hulmeville,*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bucks	Forks of Neshaminy (29 days)	....	....	....	....	50.8	....	....	....	....	....	....	....	....	....	....	....
Bucks	Quakertown	536	30.09	30.51	29.44	47.2	83	4	23	12	58.7	34.7	24.0	35	20	7	21
Cambria	Johnstown,*	1,184	30.14	30.46	29.77	48.5	8	4	25	12	59.2	37.9	21.3	40	27	8	18
Cameron	Emporium	1,050	30.09	30.48	29.75	48.0	76	3,5	22	12,18	58.4	32.8	25.6	41	3	8	10
Carbon	East Mauch Chunk	550	....	....	....	47.5	83	4	28	20	58.5	36.5	22.0	35	20	5	21
Centre	State College	1,191	30.04	30.51	29.56	45.3	78	4	24	25	55.2	35.7	19.5	31	27	5	21
Chester	West Chester	455	30.08	30.45	29.58	48.8	82	4	28	12	58.4	40.3	18.1	27	28	8	21,22
Chester	Coatesville	380	....	....	....	48.4	25	4	22	12	60.2	36.9	23.3	37	27	9	21
Chester	Kennett Square,*	275	....	....	....	47.7	....	....	....	....	....	....	....	....	....	....	....
Chester	Phœnixville,*	183	30.08	30.52	29.65	49.2	83	4	25	12	59.8	38.6	21.2	32	27	8	28
Chester	Westtown	350	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clearfield	Grampian Hills	1,450	....	....	....	44.2	76	4,5	22	12	53.8	36.2	17.6	32	7	4	14
Clinton	Lock Haven (28 days)	560	....	....	....	46.9	80	3,4	25	12,24	58.5	35.1	23.7	40	26	6	14
Crawford	Meadville	1,300	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Crawford	Saegertown	....	....	....	....	43.8	77	5	19	12	55.9	31.8	24.1	43	25	9	10
Cumberland	Carlisle	480	....	....	....	46.7	84	4	24	12	58.4	37.4	22.0	35	26,27	7	14
Dauphin	Harrisburg,*	361	30.10	30.53	29.67	48.5	80	4	30	10	57.1	39.9	17.2	28	26	7	14
Delaware	Swarthmore College,*	190	30.09	30.48	29.68	50.0	79	4	30	10	58.5	41.5	17.0	28	20	6	14
Erie	Erie,*	681	30.08	30.54	29.72	44.0	78	5	23	25	52.6	36.1	16.5	37	4	6	10
Fayette	Uniontown	1,000	....	....	....	49.4	81	4	26	13	56.5	41.2	15.3	29	13,30	6	9,19
Fulton	McConnellsburg	875	....	....	....	47.9	84	4	27	12	58.4	36.8	21.6	39	30	8	21
Huntingdon	Huntingdon,*	650	....	....	....	48.1	83	4	28	12	60.1	36.1	24.0	40	27	6	14
Lancaster	Lancaster,*	413	30.08	30.48	29.65	47.8	84	4	22	9	58.0	37.6	20.4	31	25	7	14
Lawrence	Newcastle	932	....	....	....	50.4	79	5	22	12,13	59.2	34.8	24.4	41	30	11	10
Lebanon	Lebanon	458	30.09	30.52	29.68	48.9	83	4	28	26	59.5	38.4	21.1	35	26	6	21

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Lehigh,	Coopersburg,	520				48.2	81	4	29	12	59.5	39.1	20.4	33	20	7	21
Luzerne,	Drifton (25 days),*	1,655	30.09	30.51	29.44	44.8	75	4	22	25	55.1	34.4	20.7	38	25	6	21
Luzerne,	Wilkesbarre,*	575				48.7	82	4	26	12, 17	61.0	36.4	24.6	41	27	11	22
Lycoming,	Williamsport,*					49.6	83	4	28	17, 25	61.4	37.9	23.5	36	3	11	9
McKean,	Kane,*	2,000				41.2	72	5	17	12	51.2	31.3	19.9	34	25	5	9
McKean,	Smethport,	1,500				42.5	75	5	12	12	54.8	30.2	24.6	42	26	6	9
Montgomery,	Pottstown,	150				50.5	84	4	29	12	59.7	41.2	18.5	30	27	5	21
Philadelphia,	Weather bureau,*	117	30.09	30.53	29.64	50.9	80	4	32	10	58.8	43.3	15.5	25	28	6	18
Philadelphia,	1529 Centennial avenue,*	120	30.09	30.52	29.65	52.4	82	4	32	10	61.5	43.3	18.2	26	28	6	18
Philadelphia,	3301 Haverford street,*	104				51.2	79	4	30	10	60.8	41.6	19.2	34	28	6	18, 21
Schuylkill,	Girardville,	1,000	30.02	30.38	29.45	46.3	77	4	27	17	55.4	35.4	20.0	30	27	9	21
Snyder,	Selinsgrove,	445				46.1	82	5	27	9	55.0	37.2	17.8	34	24	7	29
Somerset,	Somerset,	2,250				44.8	74	27	18	12	54.9	34.8	20.1	40	27	5	18
Sullivan,	Eagles Mere,	2,060															
Tioga,	Wellsboro,	1,327	30.09	30.55	29.68	41.8	74	4	18	18	52.2	31.5	20.7	36	18	5	21
Union,	Lewisburg,*	450	30.06	30.48	29.40	47.4	80	4	26	16, 17	58.8	36.1	22.7	34	26, 27	8	21
Warren,	Columbus,	1,410				42.6	77	5	14	12	54.1	31.1	23.0	45	26	5	9, 10
Wayne,	Newberry,	1,100				42.4	78	4	19	25	54.2	31.8	22.4	43	7	3	21
Wayne,	Honesdale,	1,000				43.7	76	4	23	25	54.7	32.8	21.9	36	27	4	21
Westmoreland,	Ligonier,	1,750															
Wyoming,	South Eaton,*	660				45.7	78	4	24	25	56.5	34.8	21.7	38	27	8	21
York,	York,*	385					85	4									

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total.	PRECIPITATION. Snow.	PRECIPITATION. Number of days with rain.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	WIND. PREVAILING DIRECTION. 2 p. m.	WIND. PREVAILING DIRECTION. 9 p. m.
Allegheny	Pittsburg,*	58.9	35.0	2.93	.2	15	5	14	11	NW	NW	NW
Berks	Hamburg	...	...	1.44	...	8	2	18	10	E	...	...
Berks	Reading,*	...	...	1.32	...	...	...	...	...	...	...	...
Blair	Altoona,†	52.8	35.0	1.66	...	11	...	...	...	...	...	...
Blair	Blue Knob	...	...	3.35	12.5	15	7	9	14	NW	NW	NW
Blair	Hollidaysburg	71.	37.4	2.84	2.0	13	10	12	8	W	W	W
Bradford	Wysox	68.9	35.3	.91	...	7	10	7	13	E	W	E
Bradford	Le Roy	...	...	0.96	1.8	11	8	11	11	SW	SW	SW
Bucks	Hulmeville,*	...	...	...	...	...	...	...	...	...	...	...
Bucks	Forks of Neshaminy (2[illegible] days)	...	...	2.46	...	11	5	17	7	N	W	N
Bucks	Quakertown	67.7	36.5	1.86	1.5	10	9	11	10	NE	NW	SW
Cambria	Johnstown,*	...	...	3.55	1.0	16	5	10	15	...	...	...
Cameron	Emporium	65.6	34.7	1.64	.5	11	8	12	10	NW	W	NW
Carbon	East Mauch Chunk	...	...	1.44	1.1	12	10	10	10	W	W	W
Centre	State College	69.9	35.8	2.09	5.5	12	6	9	15	W	W	W
Chester	West Chester	62.2	37.0	2.60	1.0	15	13	4	13	NW	NW	W
Chester	Coatesville	...	...	2.13	...	12	9	9	12	W	W	W
Chester	Kennett Square,*	...	...	3.31	2.0	15	11	4	15	NW	...	SE
Chester	Phœnixville,*	70.7	40.3	2.22	...	13	9	6	15	NW	...	NW
Chester	Westtown	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian Hills	...	...	2.34	6.0	13	5	15	10	E	NW	NW
Clinton	Lock Haven (28 days)	...	...	1.21	...	10	7	9	12	W	W	W
Crawford	Meadville	...	...	...	...	...	...	...	...	...	...	...
Crawford	Saegertown	...	...	1.73	3.5	10	7	13	10	NW	...	NW
Cumberland	Carlisle	85.5	39.5	2.77	...	11	7	14	9	W	S	W
Dauphin	Harrisburg,*	59.4	33.9	2.15	...	13	...	...	...	W	W	W
Delaware	Swarthmore College,*	75.0	41.0	1.78	...	7	9	12	9	NW	...	SW
Erie	Erie,*	66.0	32.0	1.14	...	10	9	11	10	NE	NE	NE
Fayette	Uniontown	...	...	3.23	...	12	10	13	7	NW	NW	NW
Fulton	McConnellsburg	70.0	27.2	2.19	...	7	6	14	10	W	NW	NW
Huntingdon	Huntingdon,*	...	...	2.20	2.0	11	9	14	7	W	...	W
Lancaster	Lancaster,*	80.3	40.2	1.86	3.0	13	6	13	11	NW	...	NW
Lawrence	Newcastle	...	...	1.95	1.2	10	6	5	16	SE	NW	SE
Lebanon	Lebanon	75.4	39.1	2.22	1.0	11	10	11	9	NE	...	W

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Lehigh	Coopersburg			1.58	.5	9	9	12	9	NW	NW	SE
Luzerne	Drifton (25 day).*	72.0	37.0	1.64	2.0	9	8	12	5			
Luzerne	Wilkesbarre.*			1.55	1.0	7	17	1	12	NW		SW
Lycoming	Williamsport.*			1.38	.5	8	14	7	7	W		NW
McKean	Kane.*			1.71		9	20	6	4	NW		
McKean	Smethport											
Montgomery	Pottstown	61.0	39.6	1.80		7	17	6	7	NW	W	W
Philadelphia	Weather bureau.*	61.2	36.2	2.03	.3	12	9	8	13	NW	NW	NW
Philadelphia	1529 Centennial avenue.*	67.6	39.1	2.49	.7	11	10	8	12	NW	NW	NW
Philadelphia	3301 Haverford street.*	72.0	41.0	2.34	1.5	8	13	4	13	NW		SW
Schuylkill	Girardville			1.77	2.0	9	10	9	11	W	W	W
Snyder	Selinsgrove			1.60		5	9	14	7	NW	SW	SW
Somerset	Somerset	77.0	39.8	4.43	1.2	10	21	6	3	NW	NW	NW
Sullivan	Eagles Mere											
Tioga	Wellsboro	77.4	39.2	.61	1.0	9	12	7	11	N	NW	NW
Union	Lewisburg.*	73.9	37.3	2.34		11	12	10	8	N		S
Warren	Columbus	56.0	25.0	1.63	2.0	12	9	14	7	W	W	W
Wayne	Dyberry			1.54	1.0	8	8	12	10	NW	NW	NW
Wayne	Honesdale			1.58	1.0	12						
Westmoreland	Ligonier											
Wyoming	South Eaton.*			1.20		8	13	5	12	NW		N
York	York.*			1.70								

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon.

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PRECIPITATION FOR APRIL, 1892.

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Eagles Mere.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian Hills.	Hamburg.	Harrisburg.*	Hollidaysburg	Honesdale.
1.	...	...	...	.18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.01	...	...
2.	.02	.19	...	.32	...	.06	...	...	...	...	...	.08	.03	.01	...	...	.06	...	.01	.05	...
3.	.48	.53	...	.20	...	...	.09	.13	...	...	...	.27	.16	.11	.17	.06	.12	.10	.34	1.02	.13
4.	.14	...	...	...	...	.24	...	...	...	.08	...	...	.24	...	...	...	.28	...	.06	.02	...
5.	.13	.33	...	.60	.18	.32	.05	.03	.09	.13	...	.19	.06	.02	...	.29	.21	.14	.37	.20	.11
6.	...	...	.26	...	...	...	...	...	...	...	...	...	...	...	.06	...	...	...	...	...	...
7.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8.	...	.20	...	...	.06	.28	...	.12	.10	.22	...	.20	.12	...	...	.16	.22	.10	.01	.13	.25
9.	.18	.65	...	...	.07	.16	.03	...	.16	.05	...	...	.18	.17	.12	...	.07	...	.01	.02	.06
10.	...	.15	...	...	...	.09	...	...	...	.05	...	.02	.03	...	...	...	.06	...	...	...	.01
11.	...	...	...	...	...	.08	...	...	.05	...	...	...	...	...	...	...	...	...	...	...	.02
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	.06	.15	...	.15	.34	.04	.56	.14	.10	...	...	.08	.05	.28	.46	...	.20	.31	.32	.40	.05
15.	.27	.25	.70	.51	.35	...	.22	.53	.05	...	...	.07	...	.56	.35	.25	.18	.20	.22	.23	...
16.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.09	...	...	...	...	...
17.	...	.25	...	.01	.02	.01	...	.02	.53	...	...	...	...	.01	.01	.16	.08	...	...	.11	...
18.	...	...	...	.04	.02	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...
19.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20.	...	.02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.08	...
21.	.16	.20	...	.33	.47	.28	.35	.36	.30	.75	...	.33	.12	.41	.27	.39	.40	.28	.46	.23	.69
22.	.03	.24	.46	.30	.38	.08	.18	.35	.26	...	...	.21	...	.51	.30	.33	.23	.24	.20	.23	.19
23.	.13	.06	.81	.13	.02	...	.01	.10	...	.21	...	.06	...	.07	.04	...	...	...	.03	...	...
24.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25.	...	...	...	...	.06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.08
28.	...	.01	.23	...	...	.09	...	...	...	.05	...	.13	.15	...	...	.05	.22	...	...	...	.04
29.	.06	.12	...	...	.16	...	.09	.22	...	...	...	...	...	.31	.16	...	...	.07	.12	.12	.03
30.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total.	1.66	3.35	2.06	2.77	2.13	1.63	1.58	2.00	1.64	1.54	...	1.64	1.14	2.46	1.95	1.77	2.34	1.44	2.15	2.84	1.58

* United States Weather Bureau stations.

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PRECIPITATION FOR APRIL, 1892—*Continued.*

DATE.	Huimeville.	Huntingdon.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	Le Roy	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Newcastle.	Ottsville.	Philadelphia.*	Philadelphia.	Phœnixville	Pittsburg.*	Point Pleasant.
1,	...	...	...	...	.15	.06	.08	.01	...	...	...	...	...	...	...	...	...	...	...	...	...
2,	...	.03	.05	.20	.08	.02	...	...	...	...	...	.02	...	...	.06	...	...	...	.01	.01	...
3,	...	.42	.96	.20	...	.01	.04	.26	...	.02	...	.01	.04	...	.08	.11	.02	.02	.02	.95	.17
4,	...	.22	...	.19	...	...	...	.01	.09	.62	...	.15	.04	...	.36	...	...	...	...	.23	...
5,	...	.25	.40	.04	.14	.20	.12	.29	...	.22	...	.08	.12	.68	.27	.05	.02	.03	.12	.35	...
6,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.10
7,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8,	...	...	.35	.28	...	.09	.02	.05	.15	.04	...	.04	...	...	...	...	...	...	.01	.16	...
9,	...	...	.15	...	.08	...	...	...	.04	...	...	...	.20	...	.39	...	.08	.08	.12	.37	.07
10,	...	...	.09	...	...	...	...	...	.03	...	...	...	...	...	.05	...	...	...	...	.02	...
11,	...	...	...	...	...	...	...	...	.08	...	...	...	...	...	...	...	...	...	...	...	...
12,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14,	...	.38	.47	.09	.31	.20	.27	.39	.05	.30	...	.05	.11	.30	...	.30	.19	.30	.22	.20	.27
15,	...	.21	.23	...	.60	.30	.48	.35	.03	.28	...	...	.18	.20	.20	.52	.27	.55	.77	.13	.48
16,	...	...	...	...	...	...	.03	...	...	...	...	.02	...	...	...	...	...	...	...	...	...
17,	...	.05	.11	...	.02	.03	...	...	...	.10	...	...	.11	...	.10	...	.01	.01	.01	.04	...
18,	...	...	.03	...	.08	.02	...	...	...	...	...	...	.06	...	...	...	.01	...	.01	...	...
19,	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20,	...	...	.06	...	...	...	...	...	...	...	...	.53	...	.25	...	...	...	...	...	...	...
21,	...	.30	.27	.35	.64	.36	.27	.41	.21	.56	...	.05	.27	.35	.22	.35	.50	.53	.35	.18	.44
22,	...	.02	.25	.21	.57	.32	.49	.25	.02	.02	...	.26	.26	.31	.22	.32	.46	.54	.35	.16	.29
23,	...	.30	.05	...	.08	.03	...	.04	.18	.09	...	...	.03	.10	...	.05	.06	.05	.04	.02	.03
24,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25,	...	...	...	...	.07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26,	...	...	...	...	.17	...	...	...	...	...	...	...	...	...	...	...	.08	.03	...	...	...
27,	...	...	...	.15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28,	...	...	.02	...	...	...	...	...	.13	...	...	...	...	...	...	...	...	...	...	.04	...
29,	...	.11	.07	...	.35	.22	.46	.16	...	.09	...	...	.02	...	...	.13	.38	.35	.19	.07	.28
30,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total,	...	2.29	3.55	1.71	3.31	1.86	2.26	2.22	.96	2.34	...	1.21	1.44	2.19	1.95	1.83	2.03	2.49	2.22	2.93	2.13

* United States Weather Bureau stations.

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PRECIPITATION FOR APRIL, 1892—*Continued.*

DATE.	Pottstown.	Quakertown.	Reading.	Seegertown.	Seisholtzville.	Selinsgrove.	Smethport.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wysox.	York.
1.	...	...	.02	...	...	...	...	...	...	...	...	...	...	...	.02	...	...	...	...	.01
2.	...	...	...	.10	...	...	...	...	...	...	.05	.07	...	...	.02	...	...	...	...	.01
3.	.11	.16	.15	...	.16	...	...	.17	.80	...	.68	...	.43	.02	...	...	...	.14	.07	...
4.	...	...	...	.32	...	...	...	...	...	...	...	...	...	...	...	...	.48	...	.63	.33
5.	.05	.07	.15	.06	...	.23	...	.06	.45	.22	.32	.01	.38	.20	.12	...	.11	.16	...	...
6.	...	...	...	...	.07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8.	...	.06	.01	.35	...	...	...	...	.45	.04	.04	...	.29	...	.03	...	...	.09	.15	...
9.	.08	...	.02	.19	...	...	...	.11	.08	.19	...	...	...	...	.17	...	...	...	.05	...
10.	...	...	...	.15	...	...	...	...	...	.05	...	...	.24	...	...	...	.10	...	...	...
11.	...	...	...	...	...	...	...	...	...	...	...	...	...	.10	...	...	...	...	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	...	.45	.20	.10	.30	...	...	.30	.45	.08	.18	...	.60	.08	.27	...	.36	.39	...	.40
15.	.70	.29	.27	...	.36	.04	...	.29	.10	.08	.35	...	.20	.06	.28	...	...	...	...	.07
16.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17.	...	.01	.01	...	...	...	...	...	...	...	.10	...	...	...	.02	...	...	...	...	.03
18.	...	...	.01	...	...	...	...	...	.55	...	.01	.01	.30	...	.06	...	...	...	...	...
19.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20.	...	...	...	...	...	...	...	...	...	...	...	...	.36	...	...	...	...	...	...	...
21.	.40	.30	.21	.20	.40	.24	...	.39	.55	...	.22	.56	.13	.04	.56	...	.20	.38	.26	.40
22.	.33	.35	.16	.10	.19	.03	...	.34	.50	.33	.05	.62	.05	.02	.54	...	.10	.12	.21	.27
23.	...	.02	.01	...	...	...	...	.04	.50	.21	.06	...	...	.10	.07	...	...	...	...	...
24.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25.	...	...	...	...	...	...	...	...	...	...	...	.15	...	...	.07	...	...	...	...	...
26.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.03	...	...	...	...	...
27.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28.	...	...	...	.16	...	.26	...	...	...	...	...	...	.08	.05	...	...	...	.08	.14	...
29.	.13	.15	.10	...	.14	...	...	.17	...	...	.03	.36	.17	...	.33	...	.20	.02	...	.18
30.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total.	1.80	1.86	1.32	1.73	1.62	1.60	...	1.96	4.43	1.20	2.09	1.78	3.23	.61	2.60	...	1.55	1.38	.91	1.70

H. L. B.

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FOR MAY, 1892.

General Remarks.

From the following table it appears that the normal temperature for May is a little over 60 degrees, and that but once in five years has the mean for May risen above the normal. Two "spells" of warm weather occurred; one culminating on the 2d, with maximum temperatures ranging from 83 to 88 degrees; the other period on the 30th and 31st, with maximum temperatures ranging from 80 to 91 degrees.

The coolest weather occurred on the 8th, 9th and 10th. The average rainfall for the state was over two inches above the normal. In 1889, (year of Johnstown flood) the excess was also two inches for the month. In May 1889, the greatest monthly totals were McConnellsburg, 12.41; Grampian Hills, 11.60 and Charlesville, 11.07 inches. Phenomenal rains on the 31st of that month, the greatest of which were Grampian Hills, 8.37; McConnellsburg, 7.08, and Charlesville, 6.71 inches, caused the enormous excess in the central portion of the state, and resulted in the disaster at Johnstown. The largest totals in May, 1892, were Kane, 9.39; Sægertown, 8.95; Columbus, 8.30, and Erie, 8.05 inches. The greatest amount in one day at these stations was Kane, 1.42 on 1st; Sægertown, 1.23 on 1st; Columbus, 1.41 on 15th; Erie, 1.36 on 6th. Thus, while the average excess for the month in two years was nearly the same, a wide difference is seen when we consider on what days the rainfall occurred. In 1889 but little rain occurred before the 20th; the fall was badly distributed and was in the nature of heavy local storms. In 1892, the fall was pretty evenly distributed, and occurred on many days of the month

Mean temperatures and departure from normal.

May, 1888, mean 57°.6, 3°.0 below the normal.
May, 1889, mean 62°.0, 1°.0 above the normal.
May, 1890, mean 58°.8, 1°.0 below the normal.
May, 1891, mean 57°.5, 2°.5 below the normal.
May, 1892, mean 58°.5, 1°.5 below the normal.

Mean precipitation.

May, 1888, 4.24 inches.
May, 1889, 5.91 inches.
May, 1890, 6.71 inches.
May, 1891, 2.12 inches.
May, 1892, 5.70 inches.

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Temperature.

The mean temperature for May, 1892, was 58°.5, which is about 1°.5 below the normal, and one degree above the corresponding month of 1891.

The mean of the daily maxima and minima temperatures 69°.0 and 48°.0 gives an average daily range of 21°.0, and a monthly mean of 58°.5.

Highest monthly mean, 63°.2 at Uniontown.

Lowest monthly mean, 50°.6 at Wellsboro.

Highest temperature recorded during the month, 91°.0 on the 31st at Johnstown.

Lowest temperature, 28°.0 on the 10th at Wellsboro.

Greatest local monthly range, 61° at Smethport.

Least local monthly range, 39° at Phœnixville.

Greatest daily range, 48° at Hollidaysburg on the 1st.

Least daily range, 1° at Port Carbon on the 15th.

From January 1, 1892, to May 31, 1892, the deficiency in temperature at Philadelphia was 143°, at Erie, 197°, and at Pittsburg 189°.

Barometer.

The mean pressure for the month, 29.97, is about .03 below the normal. At the United States Weather Bureau stations, the highest observed was 30.38 at Erie, on the 9th, and the lowest 29.47 at Erie on the 19th.

Precipitation.

The average precipitation, 5.70 inches for the month, is an excess of about 2¼ inches.

Wind and Weather.

The prevailing wind was from the west.

Average number: Rainy days, 16; clear days, 7; fair days, 10; cloudy days, 14.

Verification of Weather Forecasts.

Percentage of local verifications of weather and temperature signals as reported by displaymen: Weather, 83 per cent.; temperature, 87 per cent.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for May, 1892.*

COUNTIES.	STATIONS	Elevation.	Barometer Reduced to Sea Level. Mean.	Barometer Reduced to Sea Level. Highest.	Barometer Reduced to Sea Level. Lowest.	Temperature. Mean.	Temperature. Maximum. Highest.	Temperature. Maximum. Date.	Temperature. Minimum. Lowest.	Temperature. Minimum. Date.	Temperature. Mean of maximum.	Temperature. Mean of minimum.	Temperature. Daily Range. Mean.	Temperature. Daily Range. Greatest.	Temperature. Daily Range. Date.	Temperature. Daily Range. Least.	Temperature. Daily Range. Date.
Allegheny,	Pittsburg,*	847	29.97	30.29	29.60	61.2	88	31	42	22	69.7	52.5	17.2	33	5	4	12
Berks,	Hamburg,	380	....	....	....	59.3	86	2, 31	39	24	70.6	48.1	22.5	37	17	7	14, 21
Berks,	Reading,*	280	....	....	....	59.1	....	....	....	....	....	....	....	....	....	....	....
Blair,	Altoona,†	1,181	....	....	....	62.3	84	31	39	24	71.9	52.7	19.2	33	17	8	19
Blair,	Blue Knob,	2,500	....	....	....	58.0	88	31	32	8	66.0	50.0	16.0	32	8	2	19
Blair,	Hollidaysburg,	947	....	....	....	59.2	88	31	33	9	72.2	45.8	26.4	48	1	7	21
Bradford,	Wysox,	718	29.97	30.36	29.66	56.0	88	31	31	9	66.1	45.6	20.5	37	10	5	21
Bradford,	Le Roy,	1,400	....	....	....	55.0	84	31	32	8	63.7	46.1	17.6	30	10	4	14, 22
Bucks,	Hulmeville,*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bucks,	Forks of Neshaminy (30 days),	....	....	....	....	57.6	....	....	....	....	....	....	....	....	....	....	....
Bucks,	Quakertown,	536	29.99	30.37	29.65	58.8	85	2	33	1	70.8	45.6	25.2	37	1	6	14
Cambria,	Johnstown,*	1,184	30.01	30.31	29.60	60.1	91	31	36	9	72.0	48.3	23.7	44	1	10	21
Cameron,	Emporium,*	1,050	29.99	30.35	29.61	57.9	87	31	34	9	68.9	46.9	22.0	37	9, 31	4	12
Carbon,	East Mauch Chunk,	550	....	....	....	58.4	85	31	36	1	69.3	47.5	21.8	37	1	2	14
Centre,	State College,	1,191	29.92	30.34	29.57	57.4	83	31	34	8	66.8	47.2	19.6	36	1	6	12
Chester,	West Chester,	455	29.98	30.31	29.58	60.1	84	2	43	24	69.8	51.1	18.7	34	4	5	14
Chester,	Coatesville,	380	....	....	....	60.1	87	2	36	1	71.9	48.5	23.4	37	1	7	14
Chester,	Kennett Square,*	275	....	....	....	58.6	....	....	....	....	....	....	....	....	....	....	....
Chester,	Phœnixville (30 days),*	183	30.00	30.34	29.60	60.6	83	4	39	1, 8	71.1	50.1	21.0	36	4	7	21
Chester,	Westtown,	350	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clearfield,	Grampian Hills,	1,450	....	....	....	56.5	84	31	34	8	66.2	48.9	17.3	32	9	6	14, 21
Clinton,	Lock Haven,	560	....	....	....	59.5	90	31	35	9	69.2	47.7	21.5	41	17	6	12, 23
Crawford,	Meadville (28 days),	1,300	....	....	....	58.0	86	30	29	8	70.4	45.7	24.7	37	30	7	12
Crawford,	Saegertown,*	....	....	....	....	54.0	87	31	30	8	64.2	43.7	20.5	38	31	7	11
Cumberland,	Carlisle,	480	....	....	....	59.5	87	2	37	9	71.5	50.0	21.5	35	9	3	14
Dauphin,	Harrisburg,*	361	29.99	30.33	29.61	60.0	83	2	42	8	68.9	51.1	17.8	32	1	6	12, 21
Delaware,	Swarthmore College,*	190	29.95	30.33	29.57	60.8	82	31	40	2	70.3	51.3	19.0	41	2	4	10
Erie,	Erie,*	681	29.94	30.38	29.47	54.0	87	31	38	8	60.5	47.3	13.2	30	3	3	21
Fayette,	Uniontown,	1,000	....	....	....	63.2	88	31	40	22	73.2	53.3	19.9	31	9	3	10
Fulton,	McConnellsburg,	875	....	....	....	60.6	84	23, 31	34	9	72.7	48.6	24.1	41	9	10	12
Huntingdon,	Huntingdon,*	650	....	....	....	59.4	87	31	34	9, 28	72.7	46.1	26.5	46	1	9	12
Indiana,	Indiana,	1,350	29.98	30.35	29.64	57.4	88	31	32	28	68.4	46.5	21.9	36	9	12	2
Lancaster,	Lancaster,*	413	30.04	30.35	29.60	60.5	86	2	38	9	70.6	50.4	20.2	34	4	5	21
Lawrence,	Newcastle,	932	....	....	....	61.1	89	31	30	8	69.3	46.9	22.4	40	9	8	12
Lebanon,	Lebanon,*	458	30.03	30.30	29.63	59.9	85	2	36	9	70.8	49.0	21.8	37	9	6	14

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTIES	STATIONS.	Elevation.	Barometer Reduced to Sea Level. Mean.	Barometer Reduced to Sea Level. Highest.	Barometer Reduced to Sea Level. Lowest.	Temperature. Mean.	Temperature. Maximum. Highest.	Temperature. Maximum. Date.	Temperature. Minimum. Lowest.	Temperature. Minimum. Date.	Temperature. Mean of maximum.	Temperature. Mean of minimum.	Temperature. Daily Range. Mean.	Temperature. Daily Range. Greatest.	Temperature. Daily Range. Date.	Temperature. Daily Range. Least.	Temperature. Daily Range. Date.
Lehigh,	Coopersburg,	520				59.3	85	2	39	1	69.5	49.8	19.7	32	1, 9	6	14, 21
Luzerne,	Drifton (25 days).*	1,683	29.96	30.29	29.61	55.3	82	31	34	2, 9	66.5	44.1	22.4	40	31	9	12
Luzerne,	Wilkesbarre,*	575				59.9	88	2, 31	34	9	72.4	47.5	24.9	41	18	11	14, 22
Lycoming,	Williamsport,*																
McKean,	Kane,*	2,000				53.2	85	31	30	8	61.9	44.5	17.4	33	9, 28	3	19
McKean,	Smethport,*	1,500				54.6	90	30	29	9	65.5	43.7	21.8	39	31	6	22
Montgomery,	Pottstown,	150				61.5	88	2	42	8	70.9	51.1	18.8	33	4	6	14
Philadelphia,	Weather Bureau,*	117	29.99	30.35	29.60	61.9	84	31	44	8	71.1	52.7	18.4	34	4	5	14
Philadelphia,	1529 Centennial avenue,*	120	29.99	30.35	29.60	63.0	84	2, 31	44	8	73.1	53.0	20.1	32	4	5	14
Philadelphia,	3301 Haverford street,†	104				62.3	84	2	43	8	71.8	52.8	19.0	34	4	3	14
Schuylkill,	Girardville (29 days),	1,000	29.97	30.26	29.60	57.4	80	4	38	8	67.1	47.8	19.3	30	17	4	14
Schuylkill,	Port Carbon,*					60.8	87	31	37	24	69.3	52.5	16.7	38	24	1	5
Snyder,	Selinsgrove,	445	29.94	30.38	29.47	59.6	85	15, 31	40	10, 21	71.8	50.2	21.6	31	15, 24	12	7
Somerset,	Somerset,	2,250				55.2	85	31	30	8	65.9	46.5	19.4	38	1	5	12
Sullivan,	Eagles Mere,	2,060															
Tioga,	Wellsboro,	1,327	29.94	30.37	29.61	50.6	84	31	28	10	61.3	40.8	20.5	32	31	2	21
Union,	Lewisburg,*	450	29.99	30.39	29.67	57.3	83	31	30	5	69.5	45.2	24.3	45	2	6	22
Warren,	Columbus,	1,410				54.5	90	31	30	8, 9	63.8	45.4	18.4	43	9	2	21
Wayne,	Dyberry,	1,100				53.8	83	31	31	1	63.2	44.4	18.8	42	18	4	6, 12
Wayne,	Honesdale,	1,000				55.9	80	31	33	1, 9	65.5	46.4	19.1	35	10	4	21
Westmoreland,	Ligonier (16 days),	1,750				58.3	89	31	33	13, 27	72.8	43.9	28.9	42	16, 29	17	23
Wyoming,	South Eaton,*	600				56.4	82	31	36	9	66.1	46.8	19.3	35	18	7	23
York,	York,*	385	29.96	30.29	29.53	60.7	86	2	35	9	72.5	48.9	23.6	38	9	6	21

* Observation taken at 8 a. m. and 8 p. m. † Observation taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTIES.	STATIONS.	Relative humidity.	Dew point.	PRECIPITATION. Total.	PRECIPITATION. Snow.	PRECIPITATION. Number of days with rain.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	WIND. PREVAILING DIRECTION. 2 p. m.	WIND. PREVAILING DIRECTION. 9 p. m.
Allegheny	Pittsburg,*	...	...	3.77	...	21	4	11	16	NW	NW	NW
Berks	Hamburg,	...	...	4.53	...	12	2	15	14	E	...	...
Berks	Reading,*	...	...	4.00	...	16	...	...	...	...	...	...
Blair	Altoona,†	56.4	46.5	5.35	...	17	...	...	...	...	...	...
Blair	Blue Knob,	...	...	6.44	...	19	4	14	13	NW	NW	NW
Blair	Hollidaysburg,	75.0	51.0	5.32	...	18	7	11	13	W	W	W
Bradford	Wysox,	80.0	49.9	4.86	...	15	6	2	23	SE	SE	NW
Bradford	Le Roy,	...	...	5.14	...	20	3	12	16	SW	SW	NW
Bucks	Hulmesville,*	...	...	...	...	...	...	...	...	...	...	...
Bucks	Forks of Neshaminy (30 days),	...	...	6.33	...	16	8	14	8	E	W	E
Bucks	Quakertown,	76.8	51.0	5.08	...	14	7	9	15	NE	SW	SW
Cambria	Johnstown,*	...	...	6.67	...	21	3	9	19	S	...	S
Cameron	Emporium,*	79.4	48.9	7.38	...	19	6	10	15	NW	...	W
Carbon	East Mauch Chunk,	...	...	5.12	...	17	12	12	7	W	W	W
Centre	State College,	75.1	49.1	5.79	...	19	5	7	19	W	W	W
Chester	West Chester,	72.0	50.5	6.37	...	16	9	13	9	W	W	S
Chester	Coatesville,	...	...	5.97	...	15	11	12	8	W	S	W
Chester	Kennett Square,*	...	...	7.35	...	14	9	15	7	NW	...	NW
Chester	Phœnixville (30 days),*	77.4	52.5	4.93	...	19	8	7	15	NW	...	NW
Chester	Westtown,	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian Hills,	...	...	7.13	...	20	5	8	18	SW	W	W
Clinton	Lock Haven,	...	...	4.91	...	19	5	7	19	W	W	W
Crawford	Meadville (28 days),	...	...	5.75	...	16	2	7	19	SW	SW	NW
Crawford	Saegertown,*	...	...	8.95	...	21	3	11	17	W	...	N
Cumberland	Carlisle,	87.0	55.5	5.98	...	15	4	14	13	S	W	W
Dauphin	Harrisburg,*	68.4	48.8	3.95	...	18	6	10	15	NW	...	NW
Delaware	Swarthmore College,*	86.0	54.0	5.00	...	14	7	15	9	SW	...	SW
Erie	Erie,*	79.0	48.0	8.05	...	22	5	10	16	SW	SW	SW
Fayette	Uniontown,	...	...	6.48	...	16	11	15	5	SW	SW	W
Fulton	McConnellsburg,	71.3	50.0	5.97	...	10	10	11	10	W	W	W
Huntingdon	Huntingdon,*	...	...	6.24	...	15	6	13	12	W	...	W
Indiana	Indiana,	87.5	58.5	6.20	...	16	2	12	17	W	W	W
Lancaster	Lancaster,*	85.3	55.2	4.25	...	15	8	14	9	NW	...	NW
Lawrence	Newcastle,	...	...	6.29	...	16	3	8	20	S	S	S
Lebanon	Lebanon,*	79.8	51.1	5.14	...	18	8	13	10	NE	...	SW

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTIES.	STATIONS.	Relative humidity.	Dew point.	PRECIPITATION. Total.	PRECIPITATION. Snow.	PRECIPITATION. Number of days with rain.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	WIND. PREVAILING DIRECTION. 2 p. m.	WIND. PREVAILING DIRECTION. 9 p. m.
Lehigh,	Coopersburg,	...	...	5.12	...	14	5	16	10	NW	SE	SE
Luzerne,	Drifton (25 days),*	77.0	49.0	3.78	...	12	7	8	10	...	...	...
Luzerne,	Wilkesbarre,*	...	...	5.85	...	19	10	3	18	W	...	W
Lycoming,	Williamsport,*	...	...	...	...	...	...	...	...	...	...	...
McKean,	Kane,*	...	...	9.39	...	20	12	1	18	SE	...	...
McKean,	Smethport,*	...	...	...	...	...	...	...	...	S	...	S
Montgomery,	Pottstown,	75.6	52.5	7.59	...	12	11	12	8	W	W	W
Philadelphia,	Weather Bureau,	71.0	49.9	5.12	...	14	6	12	13	NW	NW	NW
Philadelphia,	1,529 Centennial avenue,*	74.0	51.3	5.28	...	15	7	12	12	NW	...	NW
Philadelphia,	3,301 Haverford street,*	73.3	51.8	5.68	...	14	10	12	9	NW	...	SW
Schuylkill,	Girardville (29 days),	...	...	4.95	...	14	10	6	13	NW	W	W
Schuylkill,	Port Carbon,*	...	...	5.42	...	12	...	...	...	...	...	...
Snyder,	Selinsgrove,	86.8	55.9	6.25	...	19	3	21	7	NW	SW	SW
Somerset,	Somerset,	...	...	5.28	...	15	4	4	23	SW	SW	SW
Sullivan,	Eagles Mere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro,	75.7	43.0	6.69	...	17	4	9	18	NW	N	N
Union,	Lewisburg,*	79.5	50.7	4.96	...	17	9	6	16	S	...	W
Warren,	Columbus,	64.0	41.0	8.30	...	19	6	8	17	SW	...	SW
Wayne,	Dyberry,	...	...	5.79	...	14	4	9	18	W	W	W
Wayne,	Honesdale,	70.2	46.5	7.15	...	17	...	...	...	...	...	...
Westmoreland,	Ligonier (16 days),	...	...	2.06	...	9	2	6	8	...	...	...
Wyoming,	South Eaton,*	...	...	5.49	...	17	5	9	17	S	...	NW
York,	York,*	82.8	58.9	4.10	...	12	10	14	7	NW	...	NW

* Observation taken at 8 a. m. and 8 p. m. † Observation taken at 12 noon.

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PRECIPITATION FOR MAY, 1892.

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian Hills.	Hamburg	Harrisburg.*	Hollidaysburg.	Honesdale.	Hulmeville.
1,	...	.02	...	...	...	.90	...	...	...	.12	.68	.60	...	...	...	.48	...	...	.01	.06	...
2,	.02	.52	.34	.52	.70	.84	.70	.44	...	.12	1.02	.93	.69	.51	.29	1.28	.20	.16	.27	.21	...
3,	.58	.13	...	...	...	.41	...	.11	.20	.76	.32	.24	.08	.02	...	.08	.21	.01	.06	1.13	...
4,	.25	.49	...	.09	...	.40	.24	...	...	...	.58	.20	...	...	.14	.58	...	.26	.19	.05	...
5	...	...	.13	...	...	.27	...	...	...	...	.13	.40	...	...	...	.02	...	.03	...	.24	...
6,	...	.28	.21	.43	.40	.95	.28	.25	.16	...	.24	1.36	.27	.24	.50	.54	.32	.19	.23	.17	...
7,	.30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10,	...	.33	...	...	...	.18	...	...	...	...	.04	.14	...	...	.06	.10	...	.03	.29	...	...
11,	.24	.06	.19	.18	.25	.32	.12	.22	...	.23	.23	.28	.28	.30	.09	.10	.23	.10	.04	.14	...
12,	...	.27	...	.03	...	.16	...	...	.09	...	.01	.31	...	...	...	.14	...	...	.02	.05	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14,	.12	.30	...	.06	.52	...	.59	.46	...	.42	.24	.04	.55	.74	.55	.31	.81	.25	.37	.95	...
15,	.47	.59	.89	.25	.61	1.41	.28	1.12	...	.74	.53	.67	.78	.61	.61	.46	.41	.09	.51	.07	...
16,	.19	.18	.11	...	.08	.19	.04	.07	...	.04	.44	.07	.09	...	...	.13	...	.01	...	...	...
17.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18.	...	...	.07	...	.03	...	...	...	...	...	...	...	...	...	...	...	...	.06	...	...	...
19.	1.22	.86	...	2.30	.65	.53	.55	.78	.80	.20	1.14	.43	1.61	.39	.64	1.15	.25	.85	1.11	1.16	...
20,	.03	.10	.54	...	.01	.05	.30	.10	.57	1.05	...	.01	.15	.31	...	.12	...	.01	.08	1.10	...
21,	1.14	.61	.46	.95	.37	.41	.64	.42	.35	1.05	.81	.86	.44	.72	.55	.78	1.08	.59	.93	.68	...
22.	.03	...	...	.06	.05	...	.01	.09	...	.35	...	.13	.10	.04	...	...	.02	...	...	.31	...
23,	...	.12	.27	.11	.48	.01	.26	.17	.58	.10	.08	.02	.31	.21	.15	.07	.14	.20	.03	...	...
24,	.02	...	...	...	...	...	...	...	.01	...	...	.02	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	.55	...	...	...	...	.25	.30	...	...	.38	.07	...	...	...	.05	...
26,	.58	1.15	...	.35	.90	.27	.58	1.10	.56	...	.33	.24	.01	.69	.64	.15	.40	.15	1.06	.20	...
27.	.12	.13	1.18	.33	.91	.17	.53	.07	.33	.23	.09	.52	.99	.75	.22	.27	.41	.34	.03	...	...
28,	.02	...	...	...	...	...	...	...	.06	...	...	...	.01	...	...	...	...	...	...	...	...
29.	...	.17	...	.02	.01	.28	...	...	...	...	.27	.28	.02	...	...	.30	...	.62	.09	...	...
30,	.02	.13	...	.30	...	...	...	...	...	.38	...	...	...	...	.13	...	...	...	.05	.58	...
31	...	...	...	...	...	...	...	.03	.57	...	...	...	...	...	...	...	...	...	...	...	...
Total.	5.35	6.44	4.39	5.98	5 97	8.30	5.12	5.43	3.78	5.79	7.38	8.05	6.33	5.53	4.95	7.13	4.53	3.95	5.32	7.15	...

* United States Weather Bureau stations

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PRECIPITATION FOR MAY, 1892—*Continued.*

DATE.	Huntingdon.	Indiana.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	Le Roy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Meadville.	Newcastle.	Ottsville.	Philadelphia.*	Philadelphia.	Philadelphia.	Phœnixville.
1	...	...	.10	1.42	...	...	...	...	.05	...	...	.05	...	...	...	...	...	...	...	...	...
2	.30	.25	.49	.50	.58	.22	.40	.33	.45	.20	...	.86	.03	.40	...	.88	.84	.70	.81	1.20	.25
3	.15	.35	.32	1.38	...	...	...	...	.26	.03	...	.05	...	...	...	.51	.01	...	...	...	.01
4	.34	.60	.72	...	...	.03	...	.12	.42	.40	...	.10	.12	...	...	.85	...	...	...	...	.01
5	...	...	...	.79	...	...	...	.02	.18	...	...	.30	.01	...	.19	...	...	...	...	...	.17
6	.52	...	.53	.36	.65	.38	.25	.25	.62	.55	...	.07	.23	.10	.40	.29	.30	.20	.18	.28	.22
7	...	.35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	.39	...	.36	.42	...	.02	...	.04	...	...	...	.02	...	...	.31	...	...	...	...	...	...
11	.05	.40	.08	.16	.63	.07	.38	.08	...	.02	...	.09	.15	.90	.42	.50	.15	.63	.53	.51	.20
12	...	.30	.19	.08	...	...	...	.01	.05	.10	...	.01	.02	...	.23	.29	...	...	...	...	...
13	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...
14	.36	.15	.31	.67	.41	.46	.37	.57	.15	.40	...	.17	.32	.38	.09	.21	.44	.34	.44	.42	.46
15	.44	1.10	.80	.68	.64	.56	.90	.20	.50	.50	...	.25	.51	.39	1.74	.62	.16	.42	.26	.35	.69
16	...	.35	.15	...	.54	...	.13	.04	.05	...	...	...	.01	...	.20	...	...	.52	.38	.43	.01
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	.04	...	.02	...	...	...	...	...	...	...	...	...	...	...	...	.01
19	1.82	...	.73	.66	.90	.40	.46	1.77	.20	1.10	...	1.90	.46	1.41	.18	.55	.51	.51	.71	.46	.52
20	.03	...	.03	.31	.35	.13	.65	.05	.62	.18	...	.01	.74	...	...	...	.47	.07	.19	.06	.37
21	.83	.70	.31	.26	.47	.53	.45	.75	.47	.44	...	.58	.88	.90	.41	.43	.85	.25	.32	.27	.45
22	...	...	...	.03	.02	...	.18	...	.03	.04	...	...	...	...	.07	...	.07	.06	.08	.09	.05
23	.05	.45	.14	...	.50	.30	.20	.13	.03	.13	...	...	.45	...	.03	.06	...	.25	.28	.31	.26
24	...	.25	.02	...	...	.07	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	.05
25	...	...	.02	.69	...	...	...	...	.18	...	...	...	...	...	.75	.35	...	...	...	...	...
26	.92	.20	.98	.58	.24	.41	...	.14	.11	.40	...	.20	.61	1.15	.26	.40	.86	.08	.08	.11	.07
27	...	.40	.19	.11	1.35	.63	1.36	.61	.66	.03	...	.02	.53	...	.26	.17	.75	1.01	1.06	1.17	1.12
28	...	.15	...	.02	...	...	...	...	...	...	...	.08	...	...	.21	...	.02	...	.01	...	...
29	.02	.20	.10	.13	.07	...	...	.01	.01	.13	...	.02	...	.21	...	.19	.01	.08	.05	.02	.01
30	.02	...	.10	...	...	...	...	...	.10	.33	...	.13	.08	.13	...	...	...	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	6.24	6.20	6.67	9.39	7.35	4.25	5.73	5.14	5.14	4.96	...	4.91	5.12	5.97	5.75	6.31	5.44	5.12	5.38	5.68	4.98

*United States Weather Bureau stations.

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PRECIPITATION FOR MAY, 1892—*Continued.*

DATE.	Pittsburg.*	Point Pleasant.	Pottstown	Port Carbon.	Quakertown.	Reading.	Seegertown.	Seisholtzville.	Selinsgrove.	Smith's Corner	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wysox.	York.
1,	.02	...	...	.10	...	...	1.23	...	...	...	...	...	.05	...	...	.20	...	...	...	...	.34	...
2,	.47	.78	.65	.15	.40	.55	.72	.63	.60	.67	.33	.27	.60	.30	.58	1.06	.55	.60	.10	...	.38	.25
3,	.27	.04	.05	...	...	...	.65	.29	.03	...	.30	.24	.06	...	.03	.10	...	...	...	...	.58	...
4,	.29	...	...	...	.05	.01	.35	...	1.05	...	...	.73	.16	...	.31	.75	...	...	.33	...	.12	...
5,	...	...	...	...	...	...	.26	...	...	...	...	...	.04	...	...	.08	...	...	.05	...	.58	...
6,	.37	.23	.33	.45	.37	.30	.30	.35	.38	.27	.25	.94	.68	.29	...	1.10	.50	.37	.21	...	.35	.25
7,	...	...	...	...	...	...	.22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10,	.18	...	...	...	...	.02	.51	...	.06	...	.30	...	.09	...	.08	...	.02	...	...	...	...	...
11,	.24	.22	.30	...	.11	.10	.50	.19	.23	.22	.25	.06	.05	.85	.14	...	.32	.23	.05	...	.15	.10
12,	.05	...	...	.50	...	...	.27	...	.18	...	.15	.04	.02	...	...	...	...	...	.07	...	...	...
13,	.01	...	...	...	...	...	.03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14,	.25	.50	.60	...	.68	.50	.72	.53	.61	.50	.25	.06	.23	.30	.40	.02	.53	.63	.15	...	.56	.25
15,	.31	.38	.31	.30	.20	.06	.91	.28	.06	.43	1.20	.37	.60	.30	1.17	.51	1.15	.97	.35	...	...	.62
16,	.07	.16	...	...	.10	.08	.32	...	...	.16	.30	...	.07	.57	...	.35	.21	...	...	...	...	.06
17,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18,	.07	...	.12	...	...	.01	...	...	.04	...	...	...	...	.05	...	...	.05	1.30	...	...	...	.03
19,	.36	1.00	1.02	.80	.59	.24	.35	1.09	1.28	.96	.35	.08	1.70	.45	.23	1.15	.68	.77	.05	...	.57	.75
20,	...	.25	...	...	.19	.20	.02	...	...	.20	...	.90	...	.05	...	.20	.03	1.09	1.00	...	.28	...
21,	.20	.60	.58	.55	.72	.51	.35	.53	.35	.62	.50	.45	.54	.20	.24	.08	.53	.41	1.55	...	.15	.76
22,	.06	.05	.50	...	.05	...	.08	...	.01	.06	...	.06	...	...	...	.05	.07	.39	...	...	.15	...
23,	.06	.25	...	.20	.22	.22	...	.25	.05	.36	.24	.35	.07	.55	.50	.02	.28	...	.88	...	...	...
24,	...	...	...	.01	...	...	...	...	.05	...	...	...	...	...	.36	...	...	...	...	...	.03	...
25,	.07	...	...	...	...	...	...	...	...	...	.70	.10	...	...	.46	.04	...	...	...	...	...	...
26,	.21	.40	2.15	.45	.88	.62	.80	.43	.89	.37	...	.05	.34	.15	.32	.55	.25	1.28	.25	...	.40	.62
27,	.15	1.02	.98	.95	.52	.57	.23	.56	.10	.99	...	.60	.14	1.09	.87	.40	1.05	.14	.55	...	...	.32
28,	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	.03	...	...	...
29,	.11	...	...	...	...	...	.18	...	.15	...	.08	...	.29	.05	.30	...	.05	.05	.30	...	.27	...
30,	...	...	...	.96	...	...	...	...	.13	...	.08	.19	.06	...	.49	...	...	...	.40	...	...	.09
31,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.02	...	...	...
Total,	3.77	5.88	7.59	5.42	5.08	4.06	8.95	5.13	6.25	5.81	5.28	5.49	5.79	5.00	6.48	6.69	6.37	7.23	5.85	...	4.86	4.10

*United States Weather Bureau stations.

H. L. B.

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FOR JUNE, 1892.

General Remarks.

The mean temperature for June, 1892, was higher than any previous year since the establishment of the service. Both maximum and minimum temperatures ranged higher than usually.

The fore part of the month was cool, and many stations recorded their lowest temperature on the 11th, 12th and 13th. From this period until after the 20th, the weather was warm, the hottest days being from the 13th to the 17th. After this the remainder of the month was cool and some stations recorded their lowest temperatures during the last week.

Frequent and in many places, violent thunder and rain storms occurred.

The storm of the 4th and 5th did great damage in the northwestern counties.

Reliable data could not be obtained of the amount which fell in the Oil Creek basin, but persons at Spartansburg claim that from 10 to 12 inches fell in seven hours on the 4th. At Columbus the observer recorded 5.36 inches in seven hours, and at Meadville, Sægertown and Erie recorded over 3 inches during the first five days of the month.

The thunder showers of the 27th were general and did much damage. In some counties the hail in this storm was reported to have destroyed the crops. The severe thunder squall on the 30th caused death and destruction at Gloucester, N. J.

The rainfall was badly distributed. In the southeastern counties the total for the month ranged from 2 to 5 inches, while in other sections as much as 10 inches fell.

Mean temperatures and departures from normal.

June, 1888, mean, 68°.6, about normal.
June, 1889, mean, 66°.5, 2° below normal.
June, 1890, mean, 70°.3, 2° above normal.
June, 1891, mean, 68°.7, about normal.
June, 1892, mean, 71°.7, 3° above normal.

Mean precipitation.

June, 1888, 3.04 inches.
June, 1889, 5.43 inches.
June, 1890, 3.42 inches.
June, 1891, 4.50 inches.
June, 1892, 5.64 inches.

Temperature.

The mean temperature for June, 1892, was 71°.7 which is about three degrees above the normal, and three degrees above the corresponding month of 1891.

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The mean of the daily maximum and minimum temperatures, 82°.2 and 61°.5 gives an average daily range of 20°.7, and a monthly mean of 71° 8.

Highest monthly mean, 76°.0 at Altoona.

Lowest monthly mean, 64°.6 at Wellsboro.

Highest temperature recorded during the month, 99°.0 on the 14th at Port Carbon.

Lowest temperature, 40°.0 on the 29th at Wellsboro.

Greatest local monthly range, 55°.0 at Port Carbon.

Least local monthly range, 33°.0 at Girardville and Swarthmore.

Greatest daily range, 45°.0 at Port Carbon on the 12th.

Least daily range, 4°.0 at Emporium, Harrisburg and Philadelphia on the 4th.

From January 1, 1892 to June 30, 1892, the deficiency in temperature at Philadelphia was 59°, at Erie 115° and at Pittsburg 70°.

Barometer.

The mean pressure for the month, 29°.98 is about .01° above the normal. At the United States weather bureau stations, the highest observed was 30°.31 at Philadelphia on the 4th, and the lowest 29.55 at Erie on the 27th

Precipitation.

The average rainfall, 5.64 inches is an excess of about 1.64 inches.

The largest totals reported in inches were Wilkesbarre, 10.55; Lock Haven, 9.66; Wellsboro, 8.84, and Kane, 8.75.

The least were Seisholtzville, 1.83; Philadelphia, 1.98, and Reading, 2.07.

Wind and Weather.

The prevailing direction of wind was from the southwest.

Average number rainy days, 13; clear days, 9; fair days, 11; cloudy days, 10.

Verification of Weather Forecasts.

Percentage of local verifications of weather and temperature signals as reported by displaymen: Weather, 88 per cent.; Temperature, 91 per cent.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for June, 1892.*

COUNTIES.	STATION.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean of maximum.	Mean of minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg.*	847	29.97	30.14	29.59	75.0	92	16	56	26	83.3	65.8	17.5	25	11	10	25
Berks	Hamburg	380				72.0	95	13, 17	46	11	83.6	60.5	23.1	38	12	5	4
Berks	Reading.*	280															
Blair	Altoona,†	1,181				76.0	94	17	58	4	85.9	66.2	19.7	31	14	14	11, 22
Blair	Blue Knob	2,500				71.4	94	13	53	28	79.8	63.0	16.8	27	11, 26	7	4
Blair	Hollidaysburg	947				71.5	95	13	47	12	85.0	58.4	26.6	43	12	13	8
Bradford	Wysox	718	29.98	30.23	29.73	69.1	93	13	44	11	81.2	59.0	22.2	39	11	7	3
Bradford	LeRoy	1,400				69.3	92	13	50	11	77.9	60.7	17.2	35	11	6	4
Bucks	Hulmeville.*																
Bucks	Forks of Neshaminy (27 days)					73.5											
Bucks	Quakertown	536				70.6	93	13	43	11	82.6	58.6	24.0	35	12	9	18
Cameron	Johnstown.*	1,184	29.99	30.21	29.59	73.4	95	16	52	1, 29	85.6	61.1	24.5	39	12	14	8, 28
Cameron	Emporium.*	1,050	29.99	30.17	29.70	71.4	95	13	51	29	82.0	60.9	21.1	39	12	4	4
Carbon	East Mauch Chunk	550				70.3	95	14	47	11	81.6	59.1	22.5	39	11, 12	7	4
Centre	State College	1,191	29.92	30.19	29.58	70.3	90	13	52	29	79.7	61.5	18.2	33	12	10	8, 30
Chester	West Chester	455	29.99	30.28	29.65	72.8	92	14	56	12	81.9	65.3	16.6	28	12	8	28
Chester	Coatesville	380				73.1	95	14	49	12	83.9	61.2	22.7	38	12	12	28
Chester	Kennett Square.*	275				72.4	91	13	56	10							
Chester	Phœnixville.*	183	30.00	30.33	29.70	73.1	93	13, 14	46	11	82.8	63.5	19.3	39	13	10	28
Chester	Westtown	350															
Clearfield	Grampian Hills	1,450				71.7	92	13, 16	52	29	81.2	66.3	14.9	36	29	6	3, 30
Clinton	Lock Haven	560				71.4	93	12	51	28, 29	83.5	60.0	23.5	44	12	6	8
Crawford	Meadville (15 days)	1,300				72.5					84.6	60.5	24.1				
Crawford	Saegertown.*					69.9	90	13	48	26	81.3	58.5	22.8	36	12	11	3
Cumberland	Carlisle	490				71.4	93	13, 14	51	11	83.9	62.7	21.2	31	12	8	4
Dauphin	Harrisburg.*	361	29.98	30.25	29.65	72.5	91	13, 14	52	11	81.8	63.2	18.6	29	12	4	4
Delaware	Swarthmore College.*	190	30.01	30.28	29.80	73.7	90	13	57	8	82.6	64.9	17.7	25	29	10	28
Erie	Erie.*	681	29.94	30.11	29.55	69.0	86	16	52	4	75.5	61.8	13.7	24	8	5	25
Fayette	Uniontown	1,000				74.9	91	16	56	11, 30	84.5	65.4	19.1	28	11	13	10, 29
Fulton	McConnellsburg	875				71.9	94	13	50	12, 13	84.9	61.0	23.9	44	13	8	8
Huntingdon	Huntingdon.*	650				71.4	94	13	49	12	83.8	59.0	24.8	42	12	10	4
Indiana	Indiana	1,550	30.02	30.23	29.64	73.0	91	16	53	10, 12	81.5	61.1	20.4	34	16	12	30
Lancaster	Lancaster.*	413	30.01	30.24	29.79	74.1	96	13	46	10	83.1	65.1	18.0	33	13	9	4
Lawrence	Newcastle	982				75.1	93	16	50	26	83.9	66.6	23.3	36	12	12	30

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Lebanon,	Lebanon,*	458	29.98	30.25	29.65	72.9	93	17	47	11	83.1	62.7	20.4	33	12	8	4
Lehigh,	Coopersburg,	520	....	....	....	70.8	91	13.14	52	11	79.4	63.4	16.0	27	11	5	4
Luzerne,	Drifton (25 days),*	1,685	29.96	30.27	29.78	68.1	90	13	47	10	78.6	57.6	21.0	42	13	6	28
Luzerne,	Wilkesbarre,*	575	....	....	....	78.4	95	13	51	11	85.1	61.8	23.2	35	11	9	28
Lycoming,	Williamsport,*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
McKean,	Kane,*	2,000	....	....	....	68.0	88	13	50	26	76.9	59.2	17.7	29	12,15	5	3
McKean,	Smethport,*	1,500	....	....	....	68.6	89	13	48	26	79.1	58.1	21.0	39	12	5	3
Montgomery,	Pottstown,	150	....	....	....	75.2	97	14	48	11	84.3	66.3	18.0	35	11	5	4
Philadelphia,	Weather bureau,*	117	30.00	30.30	29.71	74.5	93	14	56	11	83.1	65.9	17.2	26	19	4	4
Philadelphia,	1529 Centennial avenue,*	120	30.00	30.31	29.71	75.9	95	13	54	11	85.2	66.6	18.6	28	12	8	10
Philadelphia,	3301 Haverford street,*	104	....	....	....	74.6	92	13	54	11	83.0	66.3	16.7	26	13	7	10
Schuylkill,	Girardville,	1,000	29.94	30.22	29.69	70.6	88	17	50	11	79.6	61.5	18.1	30	12	9	4
Schuylkill,	Port Carbon (29 days),*	....	....	....	....	72.4	99	14	44	11	86.5	58.3	28.2	45	12	4	8
Snyder,	Selinsgrove,	445	29.91	30.22	29.67	72.3	95	14,21	52	19	85.5	63.0	22.5	33	16	14	9
Somerset,	Somerset,	2,250	....	....	....	69.6	90	16	47	11	81.0	58.3	22.7	35	7	6	9
Sullivan,	Eagles Mere,	2,060	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tioga,	Wellsboro,	1,327	29.94	30.20	29.59	64.6	90	13	40	29	77.4	55.2	22.2	32	29	8	4
Union,	Lewisburg,*	450	29.97	30.22	29.72	72.6	92	13.14	50	29	83.1	62.2	20.9	35	12	11	9
Warren,	Columbus,	1,410	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wayne,	Dyberry,	1,100	....	....	....	65.9	90	13	45	11	78.3	56.0	22.3	35	11.12	8	4,28
Wayne,	Honesdale,	1,000	....	....	....	69.3	90	13	51	11,26	79.5	59.1	20.4	30	13	6	18
Westmoreland,	Ligonier (28 days),	1,750	....	....	....	71.9	98	16,17	51	24	85.1	58.8	26.3	37	28	16	6,30
Wyoming	South Eaton,*	660	....	....	....	69.6	90	14	58	26,29	78.3	60.9	17.4	30	11,12	6	28
York,	York,*	385	29.96	30.16	29.68	74.2	95	18	46	11,12	86.0	62.5	23.5	43	12	11	8

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station	Relative humidity.	Dew point.	Number of Days. Total.	Number of Days. Snow.	Number of days with rain.	Precipitation. Clear.	Precipitation. Fair.	Precipitation. Cloudy.	Wind. Prevailing Direction. 7 a. m.	Wind. Prevailing Direction. 2 p. m.	Wind. Prevailing Direction. 9 p. m.
Allegheny	Pittsburg,*	71.8	63.5	4.15	...	16	5	18	7	SW	SW	SW
Berks	Hamburg,	...	...	4.82	...	12	8	15	7	...	...	...
Berks	Reading,*	...	...	...	...	...	...	...	...	...	...	...
Blair	Altoona,†	...	...	5.83	...	10	...	...	...	...	...	...
Blair	Blue Knob,	...	...	7.78	...	15	5	14	11	NW	NW	NW
Blair	Hollidaysburg,	78.6	64.8	6.21	...	13	12	12	6	W	W	W
Bradford	Wysox,	82.7	64.1	6.45	...	15	9	6	15	SW	NW	W
Bradford	LeRoy,	...	...	7.97	...	18	6	13	11	SW	SW	SW
Bucks	Hulmeville,*	...	...	...	...	...	...	...	...	...	...	...
Bucks	Forks of Neshaminy (27 days),	...	...	2.67	...	9	12	8	7	S	W	E
Bucks	Quakertown,	83.2	65.9	3.60	...	15	7	15	8	SW	SW	SW
Cameron	Johnstown,*	...	...	5.18	...	19	4	16	10	S	...	S
Cameron	Emporium,*	85.8	64.2	6.13	...	19	7	15	8	NE	...	NW
Carbon	East Mauch Chunk,	...	...	8.33	...	12	11	12	7	calm	W	W
Centre	State College,	77.7	63.0	7.36	...	15	8	11	11	W	W	W
Chester	West Chester,	76.0	64.0	3.55	...	11	13	8	9	S	SW	SW
Chester	Coatesville,	...	...	2.28	...	10	10	14	6	S	S	S
Chester	Kennett Square,*	...	...	2.97	...	10	12	11	7	NW	...	SW
Chester	Phœnixville,*	80.0	66.1	3.43	...	14	13	8	9	SW	...	SE
Chester	Westtown,	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian Hills,	...	...	4.97	...	13	6	14	10	SW	SW	SW
Clinton	Lock Haven,	...	...	9.66	...	14	8	8	14	W	W	W
Crawford	Meadville (15 days),	...	...	‡8.43	...	13	4	6	5	SW	SW	W
Crawford	Saegertown,*	...	...	7.73	...	20	6	11	13	SW	...	SW
Cumberland	Carlisle,	87.4	67.8	4.59	...	15	10	12	8	S	S	W
Dauphin	Harrisburg,*	75.5	63.8	4.92	...	15	5	14	11	W	W	W
Delaware	Swarthmore College,*	87.0	68.0	4.24	...	11	8	13	9	SW	...	SW
Erie	Erie,*	78.0	61.0	6.48	...	15	5	14	11	SW	SW	SW
Fayette	Uniontown,	...	...	7.70	...	14	14	7	9	SW	SW	SW
Fulton	McConnellsburg,	76.7	64.0	3.21	...	9	8	16	6	...	...	...
Huntingdon	Huntingdon,	...	...	6.44	...	16	15	8	7	W	...	W
Indiana	Indiana,	90.5	72.0	4.98	...	14	5	15	10	W	E. W	W
Lancaster	Lancaster,*	77.9	66.5	5.61	...	13	18	5	7	SE	...	SE
Lawrence	Newcastle,	...	...	7.08	...	15	8	14	10	S	S	S

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Lebanon,	Lebanon.*	83.6	65.6	4.75	...	13	11	10	9	SW	...	SW
Lehigh,	Coopersburg.	...	...	4.42	...	16	8	12	10	NE	E	NE
Luzerne,	Drifton (25 days).*	82.0	62.0	8.61	...	11	5	7	13	...	...	...
Luzerne,	Wilkesbarre.*	...	...	10.55	...	13	16	...	14	SW	...	SW
Lycoming,	Williamsport.*	...	...	...	...	...	...	...	...	...	...	...
McKean,	Kane.*	...	...	8.75	...	18	13	1	16	SE	SE	SE
McKean,	Smethport.*	...	...	...	...	...	11	10	9	S	...	S
Montgomery,	Pottstown,	78.0	65.4	3.29	...	7	17	9	4	SW	SW	SW
Philadelphia,	Weather bureau.*	73.4	63.6	1.98	...	10	10	9	11	SW	SW	SW
Philadelphia,	1529 Centennial avenue.*	75.1	65.0	2.01	...	11	11	7	12	SW	...	SW
Philadelphia,	3301 Haverford street.*	74.4	63.7	2.32	...	8	10	12	8	SW	...	SW
Schuylkill,	Girardville,	...	...	7.62	...	12	14	13	8	W	W	W
Schuylkill,	Port Carbon (29 days).*	...	...	3.71	...	14	9	10	11	...	...	...
Snyder,	Selinsgrove.	81.5	62.5	8.18	...	15	5	15	10	SW	SW	SW
Somerset,	Somerset.	86.2	67.5	4.40	...	13	9	1	20	SW	SW	SW
Sullivan,	Eagles Mere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro.	66.3	54.2	3.84	...	13	6	9	15	N	SW	N
Union,	Lewisburg.*	83.4	62.9	5.21	...	15	14	5	11	S	...	S
Warren,	Columbus.	...	...	...	...	...	...	...	...	...	...	...
Wayne,	Dyberry,	...	...	6.07	...	12	8	10	12	NW	W	NW
Wayne,	Honesdale,	76.9	66.9	5.25	...	13	...	...	...	...	...	...
Westmoreland,	Ligonier (28 days).	...	...	7.51	...	16	11	9	10	...	...	...
Wyoming,	South Eaton.*	...	...	4.50	...	14	7	14	9	S	...	S
York,	York.*	86.0	66.9	3.81	...	13	12	13	5	NW	...	NW

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon. 30 days.

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PRECIPITATION FOR JUNE, 1892.

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian Hills.	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.	Huimeville.
1.	...	.65	...	...	...	...	...	...	...	...	.01	1.65	...	...	...	...	...	...	.04	...	...
2.	...	.14	...	...	...	...	...	...	...	...	.81	.26	...	...	.04	...	...	.18	.14	.61	...
3.	.32	1.28	...	.02	...	...	1.50	...	2.99	.65	1.31	.18	...	...	3.70	1.30	.32	1.18	1.02	.35	...
4.	1.15	.40	...	.36	.07	...	.39	.09	1.04	.33	.22	.45	...	.06	.63	.22	.64	1.17	1.00	.06	...
5.	.77	.90	.48	.75	.36	...	.34	.18	...	.14	.33	.79	.53	.09	.45	...	.35	.32	1.70	.47	...
6.	.58	.50	.08	.10	.22	...	.01	.21	1.44	...	.28	...	.23	.31	...	...	.98	.18	...	...	...
7.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8.	...	.90	.13	.25	.21	...	.11	.28	.06	.19	.10	.07	.03	.18	.17	.30	.26	.33	.14	.22	...
9.	...	.02	...	.43	.08	...	.08	.29	.84	.55	...	.08	.22	.02	.41	.28	.11	.13	...	.12	...
10.	...	...	.06	.02	...	...	1.14	.32	...	...	.36	...	.10	.26	.12	...	...	...	.12	...	...
11.	...	...	...	.45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15.	...	...	.20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16.	...	.06	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...	...
17.	...	...	...	.98	.07	...	...	...	.07	.15	.26	...	...	1.00	...	.13	...	.10	...	...	...
18.	...	.17	...	...	...	...	...	...	...	...	.08	.01	...	...	...	.40	...	...	.17	.06	...
19.	.05	...	...	.22	...	...	.02	...	.84	1.10	.50	.69	...	...	.69	.18	.71	.04	.42	1.03	...
20.	.28	.85	...	.06	.04	...	.02	...	...	...	.58	.04	...	.07	...	.19	.22	.01	.06	...	...
21.	...	...	...	...	...	...	.01	...	...	...	.05	...	...	.22	...	.08	...	...	...	...	...
22.	...	...	...	.10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23.	.91	.54	...	.02	...	...	.09	...	.43	.75	.51	.22	...	...	.59	.00	.21	.16	.48	.31	...
24.	.09	.22	...	...	...	...	...	...	...	...	.06	...	...	...	...	...	...	.08	.25	.67	...
25.	...	...	.44	...	.10	...	.13	.89	.27	.28	...	...	.72	.67	...	...	.10	.28	...	...	...
26.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.54	...	...	...	...	...	...
27.	...	.68	...	.69	1.05	...	.60	.49	1.58	.94	.69	.76	.56	.97	...	.83	.72	.41	.67	.90	...
28.	1.15	...	1.14	...	...	...	.01	.13	...	...	...	.04	.25	.06	...	.07	...	...	...	...	...
29.	...	...	...	...	...	...	...	.81	.05	.77	.16	.42	...	...	.12	...	...	...	...	.11	...
30.	.03	.17	.09	.09	.08	...	.01	.10	...	.67	.36	.85	.08	.62	.16	.10	.19	.36	...	.25	...
Total.	5.33	7.78	2.62	4.59	2.20	...	4.42	3.79	9.61	6.57	6.13	6.48	2.67	4.53	7.62	4.97	4.82	4.93	6.21	5.25	...

* United States Weather Bureau stations.

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PRECIPITATION FOR JUNE, 1892—*Continued.*

DATE.	Huntingdon.	Indiana.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon	LeRoy.	Lewisburg.	Ligonier.	Lock Haven	East Mauch Chunk.	McConnellsburg.	Meadville.	Newcastle.	Oxtaville.	Philadelphia.*	Philadelphia.	Philadelphia.	Phoenixville.
1.	.25	...	.85	1.50	...	...	...	.88	...	.02	...	.22	...	...	.95	.44	...	...	...	...	...
2.	...	...	.95	1.07	...	...	...	...	.13	...	1.52	2.22	1.10	.46	.90	.58	...	...	...	...	...
3.	.56	.75	.67	.22	...	.60	...	.46	1.10	.86	.34	.20	1.29	.10	.57	.71	...	...	...	...	.01
4.	.22	...	.13	.32	...	.25	...	.81	.35	.05	...	.43	.67	.63	1.21	...	.41	.09	.09	.11	.03
5.	2.30	...	.08	.62	.56	.15	.52	.17	.16	.22	.84	...	1.31	...	.75	.05	.15	.20	.32	.35	.28
6.	.08	.65	.16	...	.16	.18	...	.16	.03	...	...	...	...	...	...	...	.12	.03	.06	...	...
7.	...	...	...	.26	...	...	...	...	...	...	.95	...	.11	...	...	...	...	...	...	...	...
8.	.01	1.05	.08	.56	.28	.20	...	.20	.05	.18	.05	.86	.63	.41	...	.26	.20	.11	.15	.16	.26
9.	.12	...	.66	...	.07	.20	...	.04	.20	1.18	.43	...	.11	.14	.05	.36	.10	.10	.01	.01	...
10.	...	.26	.02	.04	.02	.01	...	...	...	.05	...	...	...	...	...	...	.20	...	...	...	.13
11.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.02	...	.27
16.	...	...	...	.88	...	...	...	...	...	.08	...	.95	...	...	...	...	.25	...	...	...	...
17.	.10	.25	...	.09	...	.20	...	...	.18	.28	...	.01	...	.40	...	1.34	...	...	...	...	.02
18.	.09	...	1.10	.88	...	...	.18	...	.05	...	1.05	.25	...	...	...	...	.45	...	...	...	.01
19.	1.35	.15	.55	.74	...	.20	...	.88	...	.27	.40	1.30	...	.10	...	1.72	...	...	...	...	.01
20.	.21	.20	.08	.17	.02	...	...	.03	1.02	...	.05	.14	1.32	...	.40	.37	...	...	...	...	.02
21.	...	.35	.02	...	...	...	...	...	.03	...	.05	...	...	...	1.45	.12	.25	.37	.10	.17	...
22.	...	.28	.04	.18	...	...	...	...	.25	...	.29	...	...	...	...	...	...	...	...	...	...
23.	.42	.29	.46	...	...	.10	...	.10	.02	.64	.57	1.27	.62	...	.30	.38	...	...	...	...	...
24.	.13	.11	.12	...	.02	.20	...	...	.65	...	.01	...	...	.56	...	.18	...	...	...	...	...
25.	.13	...	...	...	...	.67	.80	.62	.12	...	...	...	.01	...	...	.20	.20	.04	.05	.04	.41
26.	...	...	...	.04	...	...	...	...	...	...	.02	1.50	...	...	...	...	...	...	...	...	...
27.	.42	.40	.54	.52	1.10	2.55	1.50	.88	...	.44	.22	...	.80	...	1.38	.23	.45	.27	.46	...	1.01
28.	...	.12	.02	...	.14	...	.15	...	3.20	.06	...	.20	...	...	.05	...	.10	.39	.35	.87	.77
29.	...	...	...	.42	...	...	.38	...	...	...	...	...	...	...	.12	...	...	...	...	...	...
30.	.25	.12	.20	.24	.50	...	.15	.07	.34	.05	.73	.11	.98	.41	.30	.14	.02	.38	.40	.61	.07
Total.	6.56	4.98	5.18	8.75	2.97	5.61	3.66	4.75	7.97	5.21	7.51	9.66	8.33	3.21	8.43	7.08	2.90	1.98	2.01	2.32	3.43

* United States Weather Bureau stations.

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PRECIPITATION FOR JUNE, 1892—*Continued.*

DATE.	Pittsburg.*	Point Pleasant.	Pottstown.	Port Carbon.	Quakertown.	Reading.	Segertown.	Selinsgrove.	Selinsgrove.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wyncx.	York.
1.	...	...	...	...	...	...	.53	...	...	...	.10	...	.17	...	.07	...	...	...	...	...	...	...
2.	...	...	...	...	...	...	.51	...	...	...	.65	...	...	...	...	.30	...	...	2.04	...	2.12	...
3.	.65	...	.12	.10	...	.01	.59	.19	1.33	...	.70	.64	1.05	...	1.16	1.05	...	...	1.56	...	.52	...
4.	.44	.13	...	.13	.52	.02	1.17	.23	.27	.21	...	.80	.16	.02	2.35	.33	.02	...	...	...	.08	.14
5.	.01	.17	.13	.15	.09	.05	.31	.06	.03	.16	...	.15	.10	.01	...	.08	.60	...	.40	...	...	.11
6.	.06	.05	...	.75	.21	.03	...	...	...	.26	.15	...	...	.21	...	...	.07	...	.40	...	...	.34
7.	.35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8.	.30	.34	.08	.17	.26	.16	.10	.13	.21	.24	.15	.17	.01	.28	.65	.02	.26	...	.28	...	.32	.09
9.	.23	.57	...	.14	.04	.01	1.36	.08	1.87	.72	.31	.15	.10	.10	.84	2.97	.04	...	1.60	...	.05	.10
10.	...	.65	...	...	.91	...	...	...	...	.33	.15	...	...	...	.18	...	.52	...	...	...	...	.03
11.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	...	...	...	.07	...	...	...	...	.06	...	...	...	...	...	...	...	...	...	...	...	...	...
15.	...	...	...	...	...	...	...	...	...	...	...	...	...	.08	...	...	.02	...	...	...	...	...
16.	...	...	...	...	...	...	.02	...	.35	...	...	...	...	...	...	.36	...	...	.02	...	.32	...
17.	...	...	.08	...	.12	.15	.02	...	...	.13	...	.53	.04	...	.29	.02	...	...	.13	...	.03	.76
18.	...	...	...	.02	...	...	.12	...	.20	...	.56	...	.09	...	...	...	...	...	...	...	...	...
19.	.82	...	...	.77	.02	.01	.84	...	1.30	...	.65	.06	.59	...	.21	.82	...	...	1.18	...	.80	.20
20.	.08	...	...	...	.04	.07	.23	...	.33	...	...	.38	.28	.02	.27	...	...	...	...	...	...	.18
21.	...	.05	...	...	.08	...	.28	...	.11	.07	...	.18	...	.50	.20	...	...	...	...	...	...	.04
22.	.06	...	...	...	...	...	.05	...	...	...	.22	...	...	...	.17	...	...	...	...	...	.21	...
23.	.16	.04	...	.02	.07	.02	.22	.12	.85	.05	.09	.55	1.82	...	.24	.64	...	...	1.86	...	.12	...
24.	.10	...	...	...	...	...	.06	...	...	...	...	...	...	...	...	...	...	...	...	...	.15	...
25.	.02	.19	1.53	.13	.40	1.01	...	...	.05	.23	...	.10	...	...	...	.10	.12	...	.41	...	...	.11
26.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.08	...
27.	.31	.50	1.05	.58	.77	.45	.77	1.01	.16	.45	.30	.24	2.24	1.74	.25	2.08	1.81	...	.15	...	1.08	1.64
28.	.04	.14	...	...	...	...	.05	...	...	.18	...	...	.04	.75	...	...	.02	...	...	...	...	...
29.	...	...	...	.25	.03	...	.20	...	...	...	...	.45	.05	...	...	.02	...	...	.52	...	.05	...
30.	.52	.23	.38	.09	...	.08	.30	.01	.16	.19	.37	.10	.02	.50	.82	...	.57	...	...	...	.07	.07
Total.	4.15	3.06	3.29	3.71	3.60	2.07	7.73	1.83	8.18	3.22	4.40	4.50	7.86	4.24	7.70	8.84	3.55	...	10.55	...	6.45	3.85

* United States Weather Bureau stations.

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FOR JULY, 1892.

General Remarks.

The most marked feature of the month was the excessively hot wave which overspread the whole state during the last decade and which culminated on the 26th, when a maximum temperature of 103 degrees was recorded at several stations.

The following tables are of interest as a means of comparing the present month with the same month during the years since the service was established.

The rainfall was about normal, though unevenly distributed, the unevenness being due principally to heavy local rains.

Thunderstorms were frequent, though generally light.

A very brilliant aurora was observed on the 16th.

Comparative Table.

1888, highest, 97°; lowest, 41°.

1889, highest, 96°; lowest, 42°; mean maximum, 81°.3; mean minimum, 61.8°.

1890, highest, 101°; lowest, 33°; mean maximum, 82°.3; mean minimum, 59°.1.

1891, highest, 97°; lowest, 34°; mean maximum, 78°.6; mean minimum, 56°.6.

1892, highest, 103°; lowest, 38°; mean maximum, 84°.3; mean minimum, 30°.0.

Mean temperature and departure from normal:

July, 1888, mean, 69°.4, 3° below normal.
July, 1889, mean, 71°.2, 1° below normal.
July, 1890, mean, 70°.8, 1°.5 below normal.
July, 1891, mean, 67°.9, 4°.4 below normal.
July, 1892, mean, 72°.0, normal.

Mean precipitation:

July, 1888, 3.45 inches.
July, 1889, 6.80 inches.
July, 1890, 3.52 inches.
July, 1891, 6.32 inches.
July, 1892, 3.93 inches.

Temperature.

The mean temperature for July, 1892, was 72°.0, which is normal, and 4°.1 above the corresponding month of 1891.

The mean of the daily maximum and minimum temperatures, 84°.3 and 60°.0, gives an average daily range of 24°.3, and a monthly mean of 73° 1.

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Highest monthly mean, 77°.1 at Philadelphia (Centennial avenue).

Lowest monthly mean, 64°.2 at Wellsboro.

Highest temperature recorded during the month, 103° on the 26th at Hamburg, Quakertown and Philadelphia (Centennial avenue).

Lowest temperature, 38° on the 5th at Wellsboro.

Greatest local monthly range, 58° at Wellsboro.

Least local monthly range, 35° at Lancaster.

Greatest daily range, 43° on the 10th at Hollidaysburg and 21st at Saegertown.

Least daily range, 2° on the 19th at Blue Knob.

From January 1, 1892, to July 31, 1892, the deficiency in temperature at Philadelphia was 48°, at Erie 163°, and at Pittsburg 124°

Barometer.

The mean pressure for the month, 30.07, is about .11 inches above the normal.

At the United States weather bureau stations the highest observed was 30.52 at Harrisburg on the 7th, and the lowest 29.73 at Erie on the 3d

Precipitation.

The average rainfall, 3.93 inches for the month, is very nearly the normal.

The largest monthly totals in inches were York, 8.59; Uniontown, 7.11; Coatesville, 6.02, and Blue Knob, 6.90.

The least were Wellsboro, 2.15; LeRoy, 2.39; Hamburg, 2.41, and Altoona, 2.50.

Wind and Weather.

The prevailing direction of wind was from the west.

Average number rainy days, 10; clear days, 15; fair days, 11; cloudy days, 5.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for July, 1892.*

County	Station.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean maximum.	Mean minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg.*	847	30.08	30.48	29.77	73.4	97	26	53	18	83.2	63.2	20.0	27	21	8	30
Berks	Hamburg	380				74.0	103	26	46	17	98.1	60.2	27.9	39	21,22	3	31
Berks	Reading.*	230				74.8											
Blair	Altoona.†	1,181				75.5	98	27	52	2	85.7	65.2	20.5	28	16	11	15
Blair	Blue Knob	2,500				70.6	95	24	48	17	79.8	61.5	18.3	20	21	2	19
Blair	Hollidaysburg (26 days)	947				72.0	98	26	44	17, 18	87.1	57.2	29.9	43	10	15	30
Bradford	Wysox	718	30.08	30.54	29.71	69.2	97	26	40	17	84.1	56.0	28.1	38	21	6	30
Bradford	LeRoy	1,400				70.1	96	25	47	17	80.2	60.1	20.1	28	21	11	16
Bucks	Hulmeville.*		30.05	30.50	29.67	73.5	99	26	49	18	85.8	61.2	24.6	35	18	8	31
Bucks	Forks of Neshaminy (30 days)					74.1											
Bucks	Quakertown (30 days)	536	30.06	30.50	29.68	72.2	106	26	47	5	86.4	58.0	28.4	30	21	11	31
Cambria	Johnstown.*	1,184	30.10	30.52	29.79	72.5	98	24	47	18	85.2	59.9	25.3	38	18	10	1,30
Cameron	Emporium.*	1,050	30.14	30.55	29.79	70.8	97	26	44	17	84.1	57.6	26.5	35	18,24	7	30
Carbon	East Mauch Chunk	550				71.0	100	26	45	17, 18	84.5	57.4	27.1	39	12	3	31
Centre	State College	1,191	30.03	30.50	29.78	70.7	95	26	47	2	81.4	59.4	22.0	30	21	7	30
Chester	West Chester	455	30.07	30.49	29.73	74.1	99	26	56	17	83.2	65.9	17.3	25	22	6	1
Chester	Coatesville	380				73.7	101	26	50	5, 17	86.7	60.8	25.9	39	18	10	1
Chester	Kennett Square.*	275				72.4											
Chester	Phœnixville.*	183	30.07	30.52	29.73	74.3	101	26	50	18	85.3	66.4	21.9	33	18	8	31
Chester	Westtown	350															
Clearfield	Grampian Hills	1,450				70.3	96	26	46	2, 17	82.1	62.7	19.4	36	18	8	30
Clinton	Lock Haven	560															
Crawford	Meadville (27 days)	1,300				71.0	95	27	48	5, 9	86.1	59.8	26.3	36	9	15	3, 30
Crawford	Saegertown.*					68.4	95	24, 26	41	20	83.2	53.5	29.7	43	21	13	30
Cumberland	Carlisle (17 days)	480				71.8	102	26	51	5, 8	87.4	63.0	24.4	33	8	14	2
Dauphin	Harrisburg.*	361	30.07	30.52	29.72	74.2	98	26	58	2	84.6	63.7	20.9	29	22	10	16
Delaware	Swarthmore College.*	190	30.07	30.47	29.77	74.2	99	26	56	8	84.6	63.8	20.8	27	23	11	31
Erie	Erie.*	681	30.05	30.52	29.72	70.0	90	25	51	1	78.0	63.0	15.0	26	15	8	31
Fayette	Uniontown	1,000				73.1	98	27	51	5, 18	82.8	63.4	19.4	30	18,21	7	3
Fulton	McConnellsburg	875				71.7	101	26	47	5	86.5	59.3	27.2	36	18,22	13	11
Huntingdon	Huntingdon.*	650				72.7	100	26	45	9	87.2	58.0	29.2	41	22	14	31
Indiana	Indiana	1,350															
Lancaster	Lancaster (26 days).*	413	30.03	30.43	29.88	74.4	97	26, 29	62	2	86.9	70.9	16.0	28	27	7	19
Lawrence	Newcastle	932				75.0	97	24, 25	40	17	84.7	56.4	28.3	38	18	8	30

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean of maximum.	Mean of minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Lebanon	Lebanon,*	458	30.05	30.44	29.52	73.8	102	26	48	17, 18	86.0	61.6	24.4	35	18	9	31
Lehigh	Coopersburg	520				73.0	97	26	52	17	82.7	64.0	18.7	26	21, 22	8	1
Luzerne	Drifton (25 days),*	1,683	30.04	30.42	29.81	69.0	96	25	43	18	82.4	55.6	26.8	39	25	9	30
Luzerne	Wilkesbarre,*	575				73.2	100	26	45	17	87.7	58.6	29.1	37	21, 27	18	31
Lycoming	Williamsport,*																
McKean	Kane,*	2,000				67.2	91	26	40	17	78.4	56.0	22.4	31	5, 18	6	3
McKean	Smethport,*	1,500				67.0	92	26	39	17	80.9	53.2	27.7	40	21	11	30
Montgomery	Pottstown,	150				75.0	100	26, 29	50	19	86.7	63.4	23.3	35	18	7	31
Philadelphia	Weather bureau,*	117	30.07	30.51	29.75	76.6	101	26	59	17	85.6	67.6	18.0	25	26	5	1
Philadelphia	1529 Centennial avenue,*	120	30.07	30.51	29.74	77.2	103	26	59	17	87.1	67.3	19.8	27	26	9	1, 31
Philadelphia	3301 Haverford street,*	104				75.7	100	26	57	18	84.8	66.6	18.2	25	10, 26	8	31
Schuylkill	Girardville,	1,000	29.99	30.40	29.62	72.0	97	25, 26	46	18	83.1	59.0	24.1	42	18	11	31
Schuylkill	Port Carbon (25 days),*					72.0			41	5	88.9	55.1	33.8	48	8	14	15
Snyder	Selinsgrove,	445	30.04	30.52	29.70	73.8	101	25	50	7, 17	87.8	62.5	25.3	37	25	11	3
Somerset	Somerset,	2,250				67.2	95	24	43	17	80.5	55.6	24.9	35	24	10	31
Sullivan	Eagles Mere,	2,060															
Tioga	Wellsboro,	1,327	30.04	30.46	29.73	64.3	96	25	38	5	79.3	52.9	26.4	32	10	10	3
Union	Lewisburg,*	450	30.05	30.43	29.65	72.7	102	26	46	17	86.7	58.8	27.9	39	21	5	31
Warren	Columbus,	1,410				66.4	94	24	40	17	80.6	54.2	26.4	40	24	8	3
Wayne	Dyberry,	1,100				66.6	94	28	39	17	81.5	53.2	28.3	39	21	3	31
Wayne	Honesdale,	1,000				69.0	92	28, 29	44	17	80.8	57.1	23.7	34	21	4	31
Westmoreland	Ligonier (28 days),	1,750				70.6	97	24	43	16, 17	85.4	55.9	29.5	40	18	11	30
Wyoming	South Eaton,*	660				69.9	97	26	44	17	81.2	58.5	22.7	31	21	9	31
York	York,*	385	30.02	30.40	29.72	74.0	99	26	49	17	86.8	61.2	25.6	35	18	8	31

Observations taken at 8 a. m. and 8 p. m

† Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total.	Snow.	Number of days with rain.	NUMBER OF DAYS. Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	2 p. m.	9 p. m.
Allegheny	Pittsburg,*	70.9	62.9	5.88	...	14	11	18	2	SE	SE	SE
Berks	Hamburg,	...	...	2.41	...	7	1	26	4	W	W	NW
Berks	Reading,*	...	...	3.37	...	13	...	...	...	...	...	...
Blair	Altoona,†	...	...	2.50	...	10	...	...	...	...	...	...
Blair	Blue Knob,	...	...	6.90	...	13	8	17	6	NW	NW	NW
Blair	Hollidaysburg (26 days),	76.0	64.0	3.01	...	9	17	6	3	W	W	W
Bradford	Wysox	79.0	62.6	3.19	...	12	16	7	8	NW	S	S
Bradford	LeRoy,	...	...	2.39	...	9	12	16	3	SW	SW	SW
Bucks	Hulmeville,*	...	...	4.33	...	4	18	8	5	SW	...	SW
Bucks	Forks of Neshaminy (30 days),	...	...	4.11	...	13	18	9	3	W	W	E
Bucks	Quakertown (30 days),	79.9	65.8	4.50	...	10	10	13	7	SW	SW	SW
Cambria	Johnstown,*	...	...	3.70	...	15	5	19	7	...	...	...
Cameron	Emporium,*	72.0	62.5	2.67	...	10	9	19	3	NE	...	W
Carbon	East Mauch Chunk,	...	...	3.60	...	10	17	12	2	W	W	W
Centre	State College,	75.4	62.3	3.26	...	11	10	17	4	W	W	W
Chester	West Chester,	71.0	63.5	5.87	...	12	20	4	7	NW	S	S
Chester	Coatesville,	...	...	6.92	...	8	16	8	7	W	W	W
Chester	Kennett Square,*	...	...	5.08	...	11	21	5	5	NW	...	SW
Chester	Phœnixville,*	71.3	66.7	4.39	...	11	14	8	9	NW	...	SW
Chester	Westtown,	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian Hills,	...	...	2.41	...	10	8	19	4	NW	SW	SW
Clinton	Lock Haven,	...	...	...	...	...	...	...	...	...	...	...
Crawford	Meadville (27 days),	...	...	2.40	...	4	23	1	3	...	...	...
Crawford	Sœgertown,*	...	...	3.50	...	9	17	9	5	SW	...	W
Cumberland	Carlisle (17 days),	...	...	1.34	...	4	6	9	2	...	W	...
Dauphin	Harrisburg,*	71.2	63.3	6.48	...	11	10	15	6	W	W	W
Delaware	Swarthmore College,*	64.0	61.0	3.83	...	10	9	17	5	NW	...	SW
Erie	Erie,*	67.0	60.0	2.15	...	7	14	14	3	SW	SW	SW
Fayette	Uniontown,	...	...	7.11	...	12	20	10	1	SW	SW	SW
Fulton	McConnellsburg,	75.7	63.3	4.70	...	10	15	15	1	W	W	NW
Huntingdon	Huntingdon,	...	...	3.48	...	7	19	5	7	W	...	W
Indiana	Indiana,	...	...	...	...	...	...	...	...	...	...	...
Lancaster	Lancaster (26 days),*	78.1	64.3	1.85	...	6	15	8	3	SE	...	W
Lawrence	Newcastle,	...	...	2.50	...	7	11	12	8	S	S	S

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total.	Snow.	Number of days with rain.	NUMBER OF DAYS. Clear.	Fair.	Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	2 p. m.	9 p. m.
Lebanon,	Lebanon,*	81.5	66.0	4.75	...	13	16	9	6	NW	...	SW
Lehigh,	Coopersburg,	...	...	3.48	...	11	16	10	5	NE	SW	NE
Luzerne,	Drifton (25 days),*	75.0	61.0	3.79	...	7	9	11	5	...	...	...
Luzerne,	Wilkesbarre.*	...	...	4.71	...	10	19	3	9	SW	...	SW
Lycoming,	Williamsport.*	...	...	...	...	...	...	...	...	...	...	...
McKean,	Kane.*	...	...	3.98	...	8	22	...	9	SE	SE	SE
McKean,	Smethport.*	...	...	...	...	...	26	2	3	S	...	SW
Montgomery,	Pottstown,	81.0	65.0	3.66	...	8	23	4	4	SW	SW	SW
Philadelphia,	Weather bureau.*	68.0	63.1	2.97	...	9	12	10	9	NW	NW	NW
Philadelphia,	1529 Centennial avenue.*	71.7	64.6	3.25	...	12	16	8	7	NW	...	SW
Philadelphia,	3301 Haverford street.*	72.3	64.9	5.10	...	8	13	12	6	...	...	...
Schuylkill,	Girardville,	...	...	4.35	...	8	19	8	4	W	W	W
Schuylkill,	Port Carbon (25 days),*	...	...	2.24	...	8	6	15	4	E	...	SW
Snyder,	Selinsgrove,	83.5	67.5	4.77	...	8	18	11	2	SW	SW	SW
Somerset,	Somerset,	...	...	3.97	...	11	10	14	7	SW	SW	SW
Sullivan,	Eagles Mere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro,	72.4	65.6	2.15	...	8	12	12	7	N	N	NW
Union,	Lewisburg,*	82.0	68.0	3.40	...	9	14	6	11	SW	...	S
Warren,	Columbus,	...	...	4.39	...	13	16	13	2	W	W	W
Wayne,	Dyberry,	...	...	2.91	...	10	10	18	3	W	W	NW
Wayne,	Honesdale,	71.8	59.1	3.68	...	12	...	...	...	...	...	...
Westmoreland,	Ligonier (26 days),	...	...	3.43	...	9	19	7	2	...	...	...
Wyoming,	South Eaton,*	...	...	3.14	...	7	18	10	3	S	...	S
York,	York,*	83.0	69.8	3.59	...	14	16	10	5	NW	...	NW

* Observations taken at 8 a. m. and 8 p. m

† Observations taken at 12 noon.

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PRECIPITATION FOR JULY, 1892.

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian Hills.	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.	Huimeville.
1	.04	.43	.16	...	.13	...	.58	.81	...	...	...	...	.37	1.05	...	...	.20	.02	.22	.01	...
2	...	.50	...	...	...	.04	.01	...	.27	...	...	.05	...	...	...	...	.05	.36	...	.10	...
3	.44	.63	2.11	...	1.72	2.11	1.01	1.09	...	.80	.59	1.82	1.64	1.42	.82	.88	.49	.54	.36	.82	1.93
4	...	...	...	...	...	...	.08	...	...	...	...	...	.05	.05	...	...	...	...	...	...	...
5	...	...	...	...	...	...	.03	...	...	.17	...	...	...	...	...	...	...	...	...	.03	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.04	...	...	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.02	...	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.22	...
9	...	...	...	...	...	...	...	...	...	.22	...	...	...	...	...	...	...	...	...	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	.47	...	...	...	...	.07	...	.02	.06	...	...	...	.04	...	...	...
12	...	.20	...	...	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	.02	1.59	...	...	...	.15	...	...	.32	.05	...	...	.08	...	.08	.05	...	.18	1.39	.03	...
14	.80	...	.27	...	.48	...	.06	.13	...	.06	...	...	.13	.04	...	...	...	...	...	...	...
15	...	.15	...	...	...	.90	...	...	...	...	.37	.18	.07	...	...	.15	...	...	...	.54	...
16	.02	.34	...	...	...	...	...	...	.25	.23	...	...	...	...	.32	.17	...	...	.13	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	.03	.20	...	...	...	...	...	...	...	...	...	...	.01	.06	...	...	...	...	.06	...	...
20	...	...	...	...	...	.07	...	...	...	...	...	.03	...	...	...	...	...	...	.03	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	.50	...	...	...	.05	...	...	.30	.66	.45	...	.07	...	.29	.02	...	1.10	.47	.91	...
23	.23	...	.25	...	.16	.01	.09	.11	...	...	...	...	...	.37	...	...	.33	.74	...	...	1.14
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	.70	.23	...	...	.02	...	...	...	.21	.05	...	.35	.11	...	...	...	...	...	.06	...
26	...	...	...	...	.73	...	.04	...	1.30	.10	...	...	...	...	.51	.88	...	...	...	.06	...
27	...	.70	...	...	.14	...	...	...	.35	...	.32	...	...	.02	...	.35	...	.88	.28	...	...
28	.92	...	...	...	...	.09	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	.81
29	...	...	...	...	...	.46	.78	.10	1.00	...	.63	.02	.01	.09	1.01	.16	...	...	...	.06	...
30	.10	.80	.47	...	.36	.01	.19	1.05	...	...	.13	...	.76	1.56	.32	.16	.34	.42	.07	...	.45
31	.40	.16	.55	...	3.20	...	.69	.57	...	.41	.04	...	.55	1.74	1.00	.09	.96	1.58	...	.84	...
Total	2.50	6.90	4.04	...	6.92	4.39	3.48	3.86	3.79	2.91	2.67	2.15	4.11	6.57	4.35	2.41	2.41	6.48	3.01	3.68	4.33

United States Weather Bureau stations

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PRECIPITATION FOR JULY, 1892—*Continued.*

DATE.	Huntingdon.	Indiana.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	LeRoy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Meadville.	Newcastle.	Ottsville.	Philadelphia.*	Philadelphia.	Philadelphia.	Phœnixville.
1,	.16	...	.36	...	.62	.25	.25	.12	...	...	...	...	...	...	...	...	.98	.59	.53	.61	.31
2,	...	...	...	.29	.08	...	.05	.61	.02	...	.05	...	...	...	...	...	.01	.01	.01	...	...
3,	.77	...	.72	.26	1.47	.95	1.35	.91	.52	.60	.47	...	.86	.69	.85	.96	1.24	1.30	1.30	1.71	1.62
4,	...	...	.02	...	.11	...	...	...	...	...	...	...	...	...	...	...	.20	.08	.06	.05	...
5,	...	...	...	...	...	...	...	.08	.76	.08	...	...	.04	...	...	...	.02	...	...	...	...
6,	...	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...
7,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11,	...	...	...	.61	.03	...	...	...	.03	...	...	...	...	.18	...	...	...	...	...	...	...
12,	...	...	...	...	...	...	...	...	...	...	...	...	.15	...	...	...	...	...	...	...	...
13,	.45	...	.54	.45	...	...	...	...	.14	...	...	...	...	.75	.15	.02	...	...	.12	...	...
14,	...	...	...	...	.53	.20	1.40	.10	.15	.02	...	...	.14	...	...	...	.05	.32	.22	.22	.35
15,	...	...	.01	1.21	...	...	.15	...	...	...	.30	...	...	...	1.05	.18	...	...	...	...	...
16,	.05	...	.29	...	...	...	...	...	.32	.18	...	...	.15	.10	...	...	...	...	...	...	...
17,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18,	...	...	...	...	...	...	...	...	...	...	.18	...	...	...	...	...	...	...	...	...	...
19,	...	...	.14	.02	.04	...	.05	.04	...	...	...	...	...	.20	...	...	...	.08	.03	.02	.03
20,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22,	.92	...	.02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23,	...	...	.13	...	.04	.20	...	.09	...	.07	...	...	.08	.95	...	...	.05	...	.02	...	.20
24,	...	...	...	...	...	...	...	...	...	...	.15	...	...	...	...	.05	...	...	...	...	...
25,	...	...	.09	...	...	...	.30	...	...	...	...	...	...	...	.35	...	...	.08	.21	.11	.03
26,	...	...	...	...	...	...	...	.09	...	...	.40	...	.16	...	...	...	...	...	...	...	.01
27,	.35	...	.60	.52	.28	.25	...	.81	...	.36	.25	...	.24	.85	...	.08	...	...	...	...	.06
28,	...	...	.12	...	...	...	...	.09	...	...	...	...	...	...	...	...	...	...	...	...	...
29,	...	...	.01	.62	...	...	.85	...	.24	.42	.53	...	...	.80	...	.37	...	...	.02	...	.05
30,	...	...	.42	...	.17	...	1.15	.17	...	.19	1.15	...	.54	.10	...	.24	.98	.21	.22	.22	.37
31,	.78	...	.17	...	1.71	.45	.90	1.68	.21	1.58	...	...	1.29	.08	...	...	.97	.35	.51	2.16	1.36
Total,	3.48	..	3.70	3.98	5.08	2.80	6.45	4.75	2.89	3.40	3.43	...	3.60	4.70	2.40	2.50	4.50	2.97	3.25	5.10	4.39

* United States Weather Bureau station.

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PRECIPITATION FOR JULY—*Continued.*

DATE.	Pittsburg.	Point Pleasant.	Pottstown.	Port Carbon.	Quakertown.	Reading.	Seegertown.	Selsholtzville.	Selinsgrove.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wysox.	York.
1	.08	1.10	.40	.01	.87	.23	...	.58	...	1.12	...	...	.11	.43	...	...	.22	...	.19	...	...	.07
2	.04	...	...	...	.02	.03	.05	...	...	...	.10	...	...	...	...	...	.02	...	...	...	...	.65
3	2.16	1.60	1.13	.96	1.16	.80	2.49	.75	.95	1.55	1.15	.61	.76	1.00	1.18	.08	1.48	...	1.14	...	.87	1.73
4	.02	.11	...	...	...	.03	...	.16	...	.11	.10	.08	...	.80	...	...	...	...	...	...	...	...
5	...	...	...	.01	.06	.01	...	.07	.10	...	...	...	.01	...	...	.10	...	...	.06	...	.33	...
6	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	...	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	...	.06
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.12	...	.10	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	.06	...	...	...	.04	...	...	...	.05	...	...	.01	.08	...	.02	...	...	...	.06	.04
12	...	...	...	.01	...	...	...	...	...	...	.15	...	...	...	...	...	...	...	...	...	...	...
13	.16	.04	...	.01	...	.01	.34	...	.15	...	.10	.19	.45	...	.11	.62	1.10	...	.40	...	.85	.09
14	...	.05	.14	.02	.06	.25	...	...	...	.08	...	...	.02	.42	...	...	.45	...	...	...	...	...
15	.06	...	...	...	...	...	.16	...	...	...	...	...	...	...	...	.50	.05	...	...	...	.31	...
16	.19	...	...	...	...	...	...	...	...	...	...	.69	.12	...	.79	...	...	...	.57	...	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	.25	...	...	...	...	...	...	...	...	...	.35	...	...	.05	.34	...	.06	...	...	...	...	.11
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	...	...	.52	.60	...	...	...	.18	.75	.02	...	...	.84	...	.22	.02	...	...	...	...	.04	2.11
23	...	...	...	...	.06	.06	...	...	...	...	...	...	...	.07	.92	...	...	...	...	...	...	.23
24	.09	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.09	...
25	.05	.30	.21	...	...	.42	.23	...	...	.30	...	...	...	...	.17	...	...	...	...	...	...	...
26	...	...	...	...	...	.03	...	.06	...	...	...	...	...	...	...	...	.18	...	.10	...	...	...
27	.87	...	...	...	...	.04	.02	...	.29	...	.30	.69	.12	.01	2.80	...	.06	...	1.41	...	.29	.65
28	.04	...	...	...	...	...	.14	...	...	...	...	...	...	...	...	.05	...	...	...	...	...	.04
29	.55	...	.40	...	.73	...	.03	.86	.30	...	...	...	.68	...	.03	.10	...	...	...	...	.36	.48
30	1.32	...	...	...	.43	.85	...	.15	30	.74	.32	.37	.05	.58	.20	...	.39	...	.14	...	.04	.30
31	...	.70	.80	.60	1.10	.61	...	.99	1.98	.33	1.00	.56	.16	.46	.27	68	1.84	...	.58	...	.35	2.03
Total	5.88	3.90	3.66	2.22	4.50	3.37	3.50	3.80	4.77	4.25	3.97	3.14	3.26	3.83	7.11	2.15	5.87	...	4.71	...	3.19	8.59

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FOR AUGUST, 1892.

General Remarks.

August weather was unusual. The mean temperature was above the normal for the first time in five years; the rainfall was about one-half inch below the normal; and nearly one-half of the month was clear, while only one-quarter was cloudy.

The warmest weather occurred on the 9th and 10th, when maximum temperatures ranging from 90° to 99° were recorded. Cool weather prevailed during the last half of the month.

About three times more rain fell in the central and northern counties than in the southern. The difference is especially noticeable on comparing the amounts for the northwestern and the southern counties.

The drought materially shortened the crops in many sections, principally in the central counties and on the mountain ranges. In the valleys and where benefited by local showers, the crops were about the average.

Temperature and departure from normal:

August, 1888, mean, 69°.5, 2°.3 below normal.
August, 1889, mean, 67°.4, 3°.0 below normal.
August, 1890, mean, 68°.4, 2°.0 below normal.
August, 1891, mean, 69°.7, 0°.7 below normal.
August, 1892, mean, 71°.3, 1°.0 above normal.

Mean precipitation:

August, 1888, 7.03 inches.
August, 1889, 3.24 inches.
August, 1890, 5.76 inches.
August, 1891, 5.09 inches.
August, 1892, 3.77 inches.

Temperature

The mean temperature for August, 1892, was 71°.3, which is about 1°.0 above the normal, and 1°.6 above the corresponding month of 1891.

The mean of the daily maximum and minimum temperatures, 82°.2 and 60°.5 gives an average daily range of 21°.7, and a monthly mean of 71°.4.

Highest monthly mean, 76°.1 at Philadelphia (Centennial avenue).

Lowest monthly mean, 68°.1 at Wellsboro.

Highest temperature recorded during the month, 99° on the 9th at Selinsgrove.

Lowest temperature, 42° on the 29th at Sægertown.

Greatest local monthly range, 53° at Sægertown.

Least local monthly range, 32 at Erie and Coopersburg.

Greatest daily range, 43° at Somerset on the 16th.

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Least daily range, 2° at Quakertown on the 26th, and at Dyberry on the 2d.

From January 1, 1892, to August 31, 1892, the excess in temperature at Philadelphia was 12°, at Erie a deficiency of 114° and at Pittsburg a deficiency of 79°.

Barometer.

The mean pressure for the month, 30.01 is about .03 above the normal. At the United States weather bureau stations the highest observed was 30.22 at Philadelphia on the 23d, and the lowest, 29 63 at Erie on the 25th.

Precipitation.

The average rainfall, 3.77 inches for the month, is a deficiency of about one-half an inch.

The largest monthly totals in inches were Columbus, 7.64; Erie, 6.22; Kane, 5.04; State College, 5.80; Honesdale, 5.73, and Quakertown, 5.77 inches.

The smallest were McConnellsburg, 1.07; Carlisle, 1.07; Somerset 2.09, and Pittsburg, 2.23.

Wind and Weather.

The prevailing wind was from the northwest.

Average number: Rainy days, 9; clear days, 14; cloudy days, 7; fair days, 10.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for August, 1892.*

COUNTY.	STATION.	Elevation.	BAROMETER REDUCED TO SEA LEVEL. Mean.	Highest.	Lowest.	TEMPERATURE. Mean.	MAXIMUM. Highest.	Date.	MINIMUM. Lowest.	Date.	Mean maximum.	Mean minimum.	DAILY RANGE. Mean.	Greatest.	Date.	Least.	Date.
Allegheny,	Pittsburg,*	847	30.02	30.20	29.79	73.6	94	9	56	22	83.5	63.6	19.9	28	17	9	12
Berks,	Hamburg,	380				73.2	98	9,10	55	14,23	85.0	61.5	23.5	37	17	4	2
Berks,	Reading,*	280				73.7											
Blair,	Altoona,†	1,181				74.3	94	10,11	55	29	83.6	65.0	18.6	26	22	11	25
Blair,	Blue Knob,	2,500				68.9	90	9	51	29	77.4	60.4	17.0	31	7	7	26
Blair,	Hollidaysburg (22 days),	947				70.1	97	9	45	29	84.0	55.2	28.8	41	15	15	12
Bradford,	Wysox,	718	30.03	30.24	29.75	68.8	93	9	50	16	80.4	59.6	20.8	36	8	6	28
Bradford,	Le Roy,	1,400				69.1	90	9,10	51	28	77.8	60.5	17.3	25	8,18	8	2,12
Bucks,	Hulmeville,*																
Bucks,	Forks of Neshaminy,					73.8											
Bucks,	Quakertown,	536	30.04	30.28	29.80	70.6	94	10	54	14	82.6	61.3	21.3	34	17	2	26
Cambria,	Johnstown,*	1,184	30.04	30.22	29.80	72.4	97	9	51	15,29	85.3	59.7	25.6	39	8	8	26
Cameron,	Emporium,*	1,050	30.09	30.24	29.84	69.6	95	9	49	22,29	81.0	58.2	22.8	35	15,18	7	11
Carbon,	East Mauch Chunk,	550				71.3	94	9,10	52	14,16	82.3	60.3	22.0	37	17	3	2
Centre,	State College,	1,191	29.98	30.18	29.67	69.7	91	9	47	29	80.2	59.8	20.4	31	29	11	12
Chester,	West Chester,	455	30.00	30.19	29.75	72.8	93	10	58	14	82.1	65.4	16.7	24	17	4	2
Chester,	Coatesville,	380				72.6	98	18	53	14	86.2	61.3	24.9	37	17	13	27
Chester,	Kennett Square,*	275				71.9											
Chester,	Phœnixville,*	190	30.03	30.23	29.78	73.7	94	9,10	56	14	83.4	64.0	19.4	31	17	6	2,26
Chester,	Westtown,	350															
Clearfield,	Grampian,	1,450				69.4	93	19	52	22	80.7	61.0	19.7	34	17	8	12
Clinton,	Lock Haven,	560															
Crawford,	Meadville,	1,300															
Crawford,	Saegertown,*					67.8	95	9	42	29	80.9	54.7	26.2	41	8,29	8	25
Cumberland,	Carlisle (30 days),	480				73.9	96	9,11	51	29	86.6	61.3	25.3	35	5	13	27
Dauphin,	Harrisburg,*	361	30.02	30.21	29.76	74.2	93	9	58	29	82.7	65.3	17.4	26	17	8	2
Delaware,	Swarthmore College,*	190	30.02	30.19	29.87	74.0	98	10	56	15	83.8	64.3	19.5	30	15	7	2
Erie,	Erie,*	681	29.99	30.17	29.73	70.0	88	8	56	29	77.0	63.0	14.0	22	8	5	31
Fayette,	Uniontown,	1,000				72.7	92	9	53	14,16	82.4	63.1	19.3	30	16	6	12
Fulton	McConnellsburg,	875				72.4	96	9	52	16	86.6	61.6	25.0	38	15	12	24
Huntingdon,	Huntingdon,*	550				72.3	96	9	47	22	86.1	58.5	27.6	40	15	15	31
Indiana,	Indiana,	1,350	30.09	30.23	29.86	70.6	98	9	47	22	82.2	57.4	24.8	36	15,22	11	26
Lancaster,	Lancaster,*	413															
Lawrence,	Newcastle,	932				69.7	94	9	45	5	83.8	55.7	28.1	39	29	11	10
Lebanon,	Lebanon,*	458	30.02	30.20	29.76	72.9	98	9,10	52	14	84.0	61.7	22.3	37	15	5	2

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Lehigh,	Coopersburg,	520	....	....	....	71.3	90	9.10	58	14	80.0	64.1	15.9	25	17	4	2
Luzerne,	Drifton (27 days),*	1,683	29.99	30.16	29.78	68.3	90	9	51	16	77.1	59.6	17.5	30	16	3	2
Luzerne,	Wilkesbarre *	575	....	....	....	72.2	95	9	53	22,29	84.1	60.4	23.7	34	17	9	12
Lycoming,	Williamsport,	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
McKean,	Kane,*	2,000	....	....	....	65.5	91	9	44	29	76.5	54.5	22.0	49	9	5	12
McKean,	Smethport,*	1,500	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Montgomery,	Pottstown,	150	....	....	....	74.0	96	10	56	14	84.5	63.5	21.0	38	17	4	2
Philadelphia,	Weather Bureau,*	117	30.02	30.22	29.75	75.6	96	10	61	27	83.8	67.5	16.3	23	10	5	2
Philadelphia,	1529 Centennial avenue,*	120	30.01	30.22	29.76	76.1	97	10	61	14	84.6	67.6	17.0	24	10	4	2
Philadelphia,	3301 Haverford street,*	104	....	....	....	75.3	95	10	60	14	83.7	66.9	16.8	24	15,17	4	2
Schuylkill,	Girardville (30 days),	1,000	29.97	30.12	29.75	71.2	90	10	55	16	80.6	62.3	18.3	29	17	5	31
Schuylkill,	Pottsville,	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Snyder,	Selinsgrove,	455	30 00	30.21	29.78	72.5	99	9	51	30	86.7	60.2	26.5	38	28	14	2
Somerset,	Somerset,	2,250	....	....	....	67.4	92	16	44	4	81.9	55.2	26.7	43	16	8	2,26
Sullivan,	Eagles Mere,	2,060	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tioga,	Wellsboro,	1,327	29.98	30.21	29.67	65.1	92	9	48	22	74.6	55.2	19.4	32	7	5	26
Union,	Lewisburg,*	450	29.99	30.17	29.77	72.3	93	9	51	29	83.9	60.8	23.1	40	9	10	2
Warren,	Columbus,	1,410	....	....	....	66.0	92	9	44	1.29	78.5	55.0	23.5	40	1,29	6	31
Wayne,	Dyberry,	1,100	....	....	....	65.9	92	10	45	22	78.9	55.2	23.7	38	17	2	2
Wayne,	Honesdale,	1,000	....	....	....	68.1	89	9,10	56	22	71.9	58.4	13.5	30	8,17	4	26
Westmoreland,	Ligonier (28 days),	1,750	....	....	....	70.0	98	1	45	21	86.1	55.4	30.7	40	22	18	23
Wyoming,	South Eaton,*	680	....	....	....	69.7	90	9	51	22	78.9	60.6	18.3	30	17	8	26
York,	York,*	385	29.98	30.23	29.69	73.5	95	10	52	29	85.8	61.1	24.7	35	15.17	12	2

* Observations taken at 8 a. m. and 8 pm. † Observations taken 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station.	Relative humidity.	Dew point.	Precipitation. Total.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing Direction. 7 a. m.	Wind. Prevailing Direction. 2 p. m.	Wind. Prevailing Direction. 9 p. m.
Allegheny	Pittsburg.*	67.4	60.4	2.22	...	7	11	6	14	N	N	N
Berks	Hamburg	...	...	3.78	...	7	...	...	...	NW	...	...
Berks	Reading.*	...	...	4.57	...	8	...	...	...	...	...	...
Blair	Altoona.†	...	...	2.96	...	9	...	...	...	...	...	...
Blair	Blue Knob	...	...	4.35	...	9	10	13	8	NW	NW	NW
Blair	Hollidaysburg (22 days)	77.0	62.0	3.53	...	5	13	6	3	W	W	W
Bradford	Wysox	84.3	64.3	4.37	...	10	11	6	14	NW	NW	NW
Bradford	Le Roy	...	...	4.04	...	11	11	10	10	SW	SW	SW
Bucks	Hulmeville.*	...	...	...	...	...	...	...	...	...	...	...
Bucks	Forks of Neshaminy	...	...	3.54	...	8	16	10	5	W	E	W
Bucks	Quakertown	83.3	63.3	5.77	...	12	11	14	6	SW	SW	SW
Cambria	Johnstown.*	...	...	2.29	...	9	6	19	6	S	...	S
Cameron	Emporium.*	79.0	62.8	3.02	...	9	9	12	10	NE	...	NW
Carbon	East Mauch Chunk	...	...	3.90	...	9	17	11	3	W	W	W
Centre	State College	75.3	61.4	5.80	...	12	12	11	8	W	W	W
Chester	West Chester	74.0	64.5	3.50	...	12	21	6	4	N	NW	NW
Chester	Coatesville	...	...	2.37	...	9	17	10	4	W	W	W
Chester	Kennett Square.*	...	...	3.13	...	10	14	13	4	NE	...	SW
Chester	Phœnixville.*	81.1	66.6	3.68	...	10	12	10	9	NW	...	SE
Chester	Westtown	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian	...	...	3.74	...	8	...	...	...	SW	SW	W
Clinton	Lock Haven	...	...	...	...	...	...	...	...	...	...	...
Crawford	Meadville	...	...	...	...	...	...	...	...	...	...	...
Crawford	Saegertown.*	...	...	4.76	...	11	13	11	7	S	...	NW
Cumberland	Carlisle (30 days)	...	...	1.97	...	7	17	9	4	S	SW	SW
Dauphin	Harrisburg.*	74.3	63.2	2.39	...	10	11	13	7	W	W	W
Delaware	Swarthmore College.*	...	...	3.31	...	7	11	13	7	NW	...	SW
Erie	Erie.*	70.0	60.0	6.22	...	11	8	14	9	NE	NE	NE
Fayette	Uniontown	...	...	2.40	...	7	20	10	1	NW	SW	SW
Fulton	McConnellsburg	73.8	63.8	1.07	...	3	15	14	2	NW	NW	NW
Huntingdon	Huntingdon.*	...	...	4.03	...	9	17	6	8	W	...	W
Indiana	Indiana	81.9	65.6	1.90	...	5	8	10	4	W	W	W
Lancaster	Lancaster.*	...	...	...	...	...	...	...	...	...	...	...
Lawrence	Newcastle	...	...	3.31	...	5	12	11	8	S	W	W
Lebanon	Lebanon.*	85.3	65.8	3.80	...	9	15	13	3	NW	...	NW

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Lehigh,	Coopersburg,	...	...	4.05	...	12	14	10	7	SW	SW	NE
Luzerne,	Drifton (27 days),	81.0	63.0	4.79	...	7	11	10	6	...	...	...
Luzerne,	Wilkesbarre,*	...	...	5.56	...	8	18	...	13	NW	...	SW
Lycoming,	Williamsport,	...	...	...	...	...	...	...	...	...	...	...
McKean,	Kane,*	...	...	5.94	...	11	22	...	9	SW	...	...
McKean,	Smethport,*	...	...	...	...	...	...	...	...	...	...	...
Montgomery,	Pottstown,	81.0	66.7	3.49	...	6	20	7	4	NW	SW	SW
Philadelphia,	Weather Bureau,*	73.0	64.2	2.74	...	9	11	11	9	NW	NW	NW
Philadelphia,	1529 Centennial avenue,*	74.9	65.5	3.03	...	11	16	7	8	SW	...	SE
Philadelphia,	3301 Haverford street,*	76.3	65.4	4.90	...	9	16	7	8	...	...	...
Schuylkill,	Girardville (30 days),	...	...	2.50	...	6	23	2	5	NW	W	W
Schuylkill,	Pottsville,	...	...	...	...	...	...	...	...	...	...	...
Snyder,	Selinsgrove,	81.8	67.8	3.17	...	10	3	21	7	NE	NW	SW
Somerset,	Somerset,	84.1	60.8	2.09	...	7	10	9	12	NW	NW	NW
Sullivan,	Eagles Mere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro,	67.9	59.6	4.73	...	10	9	9	13	N	N	N
Union,	Lewisburg,*	86.0	65.4	4.55	...	13	17	4	10	N	...	S
Warren,	Columbus,	63.0	52.4	7.64	...	14	11	15	5	N	N	N
Wayne	Dyberry,	...	...	4.64	...	10	8	11	12	NW	NW	NW
Wayne,	Honesdale,	81.1	62.1	5.78	...	11	...	...	...	...	...	...
Westmoreland,	Ligonier (28 days),	...	...	2.24	...	4	20	7	1	...	...	...
Wyoming,	South Eaton,*	...	...	2.85	...	7	15	9	7	NW	...	NW
York,	York,*	83.2	66.3	2.81	...	7	20	9	2	NW	...	NW

* Observations taken at 8 a. m. and 8 p. m. † Observations taken 12 noon.

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PRECIPITATION DURING AUGUST, 1892.

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus.	Cooperaburg.	Doylestown.	Drifton.	Dyberry.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian.	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.	Hulmeville.	Huntingdon.
1							.01															
2	1.33	.89		.75	.20	.12	.60	.43	.53	.33	.62		.59	.61	.54	1.15	.44	.26	1.62	.35		1.76
3			.64				.01															
4						.50					.08	.16										
5					.15		.20	.11	.36	.16			.08					.01		.40		
6						.02						.04										
7																						
8																						
9																				.67		
10					.30	2.00	.38		.95	1.49	.01	.64	.47	.18	.41	.08	.45	.20		.59		.12
11	.18	.69	.59		.02	2.19	.84	.42		.27	.77	.77			.45	.10	.92		.43	.28		.10
12	.09	.24		.22		.05	.05	.14	.97	.20	.04		.77	.10	.10		.45	.19	.23			.08
13						.01			.63	.14										.06		
14																						
15																						
16																						
17																				1.55		
18																						
19						.95				.40	.05	.97				.38						
20	.28	1.51										.04			.04			.06				
21			.50		.02	.02		.22					.21					.18				
22																						
23						.07																
24				.05	.02	.40	.05					.44		.08								
25	.24	.15	.10	.15	1.40	1.18	1.22	.78	1.31	.69	1.25	2.14		1.00	1.02	1.42	1.30	.68		1.08		.24
26	.27	.40	1.26	.57	.06		.22	.32		.61		.75		.26		.33	.09	.74		.60		.71
27	.42	.20		.20			.02	.04			.06	.06	1.21					.01	.82			.20
28	.10			.03									.05							.08		.10
29																						
30		.01				.08										.15						
31	.05	.26	.45		.20	.05	.45	.51	.04	.35	.15	.21	.16	.23		.13	.13	.06	.23	.17		.72
Total	2.96	4.35	3.54	1.97	2.37	7.64	4.05	2.97	4.79	4.64	3.02	6.22	3.54	2.46	2.56	3.74	3.78	2.39	3.53	5.78		4.03

* United States Weather Bureau stations.

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PRECIPITATION DURING AUGUST, 1892—*Continued.*

DATE.	Indiana.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	Le Roy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Meadville.	Newcastle.	Oxtaville.	Philadelphia.*	Philadelphia, 1529 Centennial avenue.	Philadelphia, 3301 Haverford street.	Phœnixville.	Pittsburg.*
1,	...	...	.59	...	...	...	...	...	.02	.35	...	...	...	...	...	.06	...	.01	...	...	...
2,	...	1.03	.03	.67	...	.35	1.67	1.43	.98	...	...	.65	.77	...	...	.17	.25	.36	.21	.61	.68
3,	...	...	...	...	...	...	...	...	.02	...	...	.03	...	...	...	...	...	...	...	.05	...
4,	...	...	.10	...	...	...	...	.60	.02	...	...	...	...	...	.43	...	...	...	...	...	...
5,	...	...	...	.17	...	...	.01	...	.12	...	...	.06	...	...	...	...	.22	.22	.31	.08	...
6,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10,	...	.02	2.15	...	...	...	...	.09	.58	...	...	...	.20	...	.48	.25	...	...	...	...	.08
11,	.10	.20	.58	.04	...	.83	.12	.18	.20	1.00	...	1.41	.10	...	...	.40	.04	.03	.04	.58	.29
12,	...	.07	.03	.05	...	...	.15	.61	.06	...	...	.50	...	...	...	.14	.42	.44	1.21	.05	...
13,	...	...	...	...	...	...	...	.03	...	...	...	...	...	...	...	...	...	...	...	...	...
14,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19,	...	.14	.05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20,	...	.30	...	...	...	...	...	.22	.17	...	...	.05	...	...	...	...	...	...	...	...	...
21,	...	...	...	.07	...	...	.30	...	...	...	...	...	...	...	...	...	.12	.12	.44	.21	...
22,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.19
24,	...	...	.96	.09	...	...	.07	...	...	...	...	...	...	...	...	...	.30	.33	.22	...	...
25,	1.32	.20	.88	.23	...	1.10	1.29	.60	2.01	...	...	.94	...	...	1.57	.33	.08	.06	.71	.83	.32
26,	.05	.02	...	1.36	...	.90	.01	.03	.02	.64	...	.11	...	...	.16	.75	1.28	1.35	1.70	1.02	.04
27,	...	...	...	...	...	...	...	.03	.02	...	...	...	...	...	...	...	...	.02	...	.05	...
28,	...	...	...	.07	...	...	...	...	...	...	...	...	...	...	...	...	.03	...	...	...	...
29,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30,	.38	...	1.02	...	...	...	...	...	...	.25	...	...	...	...	.67	...	...	...	...	...	...
31,	.05	.31	.05	.38	...	.40	.18	.22	.33	...	...	.15	...	...	...	.30	...	.09	.06	.25	.62
Total.	1.90	2.29	5.94	3.13	...	3.58	3.80	4.04	4.55	2.24	...	3.90	1.07	...	3.31	2.40	2.74	3.03	4.90	3.68	2.22

* United States Weather Bureau stations.

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PRECIPITATION DURING AUGUST, 1892—*Continued.*

DATE.	Point Pleasant.	Pottstown.	Pottsville.	Quakertown.	Reading.	Segertown.	Seisholtzville.	Sellingrove.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wysox.	York.
1.	.40			.02			.05		.03							.08					
2.	.04	.40	1.42	.69	.30		.57	.53	.38	.50	1.07	2.06	1.01	.47	1.68	1.32		.45		1.04	.54
3.				.04					.10							.03					
4.						.75					.19	.01			.10					.54	
5.				.33	.02			.07				.01	.03			.12		.30			.02
6.																					
7.																					
8.																					
9.			.50																		
10.		.42	.50	.80		.22	.47	.52		.10	.16	.01		.08	.08	1.15		2.67		.01	
11.	1.52	.05	.95	1.16	.63	1.77	.55	.25	1.36	.20	.11	1.32	.02	.34	1.70	.05		.18		1.41	
12.	.10	.09	.05	.08	.27	.05	.06	.37	.07		.12	.04	.09		.15	.09		.23		.03	
13.															.02					.05	
14.																					
15.																					
16.																					
17.																					
18.																					
19.						.24				.12				.08	.05					.02	
20.								.03		.52		.02						.05			
21.					.01				.08				.43			.10					
22.																					
23.																					
24.				.10		.06	.08	1.17												.64	
25.	.80	2.35	.55	1.81	2.85	1.09	.42	.07	.29	.47	.99	1.45		.93	.75	.52		1.40		.49	.99
26.	.26		.70	.19	.25	.30	.16	.06	.87			.38	1.72	.10		.97					.50
27.	.03			.03		.04			.05			.36			.10	.03					.09
28.												.01									.30
29.																					
30.						.07		.10												.14	
31.	.35	.18	.40	.52	.24	.17	.07		.20	.18	.21	.13	.01	.40	.10	.09		.28			.37
Total	3.50	3.49	5.07	5.77	4.57	4.76	2.93	3.17	3.38	2.09	2.85	5.80	3.81	2.40	4.73	3.50		5.56		4.37	2.81

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FOR SEPTEMBER, 1892.

General Remarks.

The chief characteristic of the past month was the high percentage of clear and fair days. The average number of rainy days was seven, or twenty-three per cent., which is about ten per cent. less than the usual number of rainy days during September. The average cloudiness was about twenty-five per cent. less than usual. As will be seen from the following tables, the mean temperature was above and the rainfall below the normal.

The mild and open weather afforded good opportunity for completing the corn harvest, but the dry ground was unfavorable in many places for fall seeding. After the 22d very little rain occurred and there were many complaints of drought.

Mean temperature and departure from normal:

September, 1888, mean 59°.0, 2° below normal.
September, 1889, mean 61°.0, 1° above normal.
September, 1890, mean 63°.0, 1° above normal.
September, 1891, mean 66°.4, 5°.4 above normal.
September, 1892, mean 62°.3, 1°.3 above normal.

Mean precipitation:

September, 1888, 4.84 inches
September, 1889, 5.05 inches.
September, 1890, 4.57 inches.
September, 1891, 2.39 inches.
September, 1892. 2.81 inches.

Temperature.

The mean temperature for September, 1892, was 62°.3, which is about 1°.3 above the normal, and 4°.1 below the corresponding month of 1891.

The mean of the daily maximum and minimum temperatures, 73°.9 and 51°.0, gives an average daily range of 32°.8 and a monthly mean of 62°.4.

Highest monthly mean, 67°.1 at Philadelphia (Centennial avenue).

Lowest monthly mean, 84°.7 at Wellsboro.

Highest temperature recorded during the month, 90° on the 4th at McConnellsburg.

Lowest temperature, 29°.0 on the 30th at Selinsgrove.

Greatest local monthly range, 59°.0 at Selinsgrove.

Least local monthly range, 35°.0 at Philadelphia (weather bureau).

Greatest daily range, 51°.0 at Somerset on the 2d.

Least daily range, 1°.0 at Blue Knob on the 23d.

From January 1, 1892, to September 30, 1892, the deficiency in temperature at Philadelphia was 14° at Erie 111° and at Pittsburg 69°.

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Barometer.

The mean pressure for the month, 30.155, is about .07 inch above the normal. At the United States weather bureau stations the highest observed was 30.44 at Harrisburg on the 8th, and the lowest, 39.39, at Erie on the 13th.

Precipitation.

The average rainfall, 2.81 inches for the month, is a deficiency of .33 inch.

The largest monthly totals in inches were, Carlisle, 4.85; Blue Knob 4.62, and Columbus, 4.15 inches.

The least were, Wellsboro, 1.18; Lock Haven, 1.34; Somerset, 1.42; Wysox, 1.49; Johnstown, 1.60; Swarthmore, 1.79, and Altoona, 1.94.

Wind and Weather.

The prevailing wind was from the west.

Average number: Rainy days, 7; clear days, 16; fair days, 7; cloudy days, 7.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for September, 1892.*

County.	Stations.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean maximum.	Mean minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg,*	847	30.15	30.35	29.49	66.5	86	4	46	7	76.7	56.3	20.4	33	4	8	1
Berks	Hamburg	380	....	....	....	63.2	86	5, 25	40	30	75.8	51.1	24.7	37	3, 30	11	23
Berks	Reading,*	230	....	....	....	63.0	....	....	....	....	....	....	....	....	....	....	....
Blair	Altoona,†	1,181	....	....	....	65.5	85	26	46	7	74.4	56.6	17.8	30	20	7	21
Blair	Blue Knob	2,500	....	....	....	59.1	76	4	36	7	65.6	52.7	12.9	30	7	1	23
Blair	Hollidaysburg	947	....	....	....	61.7	86	25	35	2, 7	75.2	48.0	27.2	46	4	10	11
Bradford	Wysox	718	30.16	30.39	29.75	59.3	86	18	33	30	72.4	47.6	24.8	44	30	10	22
Bradford	LeRoy	1,400	....	....	....	61.2	81	25	40	20	70.7	51.8	18.9	32	20	5	1
Bucks	Hulmeville,*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bucks	Forks of Neshaminy (29 days)	....	....	....	....	61.9	....	....	....	....	....	....	....	....	....	....	....
Bucks	Quakertown	536	30.20	30.44	29.73	61.2	85	5	37	21	75.0	50.6	24.4	35	21	12	22
Cambria	Johnstown,*	1,184	30.18	30.41	29.61	64.4	89	4	41	7	77.8	51.0	26.8	46	4	10	1
Cameron	Emporium,*	1,050	30.23	30.48	29.80	61.5	85	25	38	27	73.7	49.3	24.4	40	30	7	13
Carbon	East Mauch Chunk	550	....	....	....	63.3	83	5, 25	39	21	73.4	50.4	23.0	37	5	9	22, 26
Centre	State College	1,191	30.22	30.38	29.57	61.6	81	25	41	2, 30	70.8	50.9	19.9	35	30	7	22
Chester	West Chester	455	30.17	30.40	29.73	63.9	84	5	47	27, 30	74.2	55.2	19.0	28	30	8	22
Chester	Coatesville	380	....	....	....	62.5	87	25	39	30	77.4	49.7	27.7	39	5, 30	11	22
Chester	Kennett Square,*	275	....	....	....	61.9	....	....	....	....	....	....	....	....	....	....	....
Chester	Phœnixville,*	193	30.19	30.43	29.75	64.4	86	5	41	30	75.3	53.5	21.8	34	30	7	23
Chester	Westtown	350	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clearfield	Grampian	1,450	....	....	....	60.5	82	23	38	7	71.6	52.0	19.6	34	30	6	13
Clinton	Lock Haven	560	....	....	....	62.0	85	18, 25	39	7	75.7	48.3	27.4	37	29	15	26
Crawford	Meadville	1,300	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Crawford	Sægertown,*	....	....	....	....	59.7	86	24	34	18, 28	73.7	45.6	28.1	45	18	8	13
Cumberland	Carlisle	480	....	....	....	64.0	86	5, 25	42	7	75.8	52.2	23.6	37	3, 4	8	8
Dauphin	Harrisburg,*	361	30.18	30.43	29.70	64.4	85	18	48	30	73.0	55.9	17.1	29	18	5	24
Delaware	Swarthmore College,*	190	30.18	30.40	29.81	65.4	84	19	42	30	76.1	54.7	21.4	33	5	9	22
Erie	Erie,*	681	30.10	30.36	29.39	63.0	83	4	44	20	70.0	56.0	14.0	24	4	4	5
Fayette	Uniontown	1,000	....	....	....	64.9	84	24, 25	39	27	75.4	54.4	21.0	34	28	10	13, 21
Fulton	McConnellsburg	875	....	....	....	63.9	90	4	38	7	77.3	50.7	26.6	42	2	8	13
Huntingdon	Huntingdon,*	650	....	....	....	62.1	86	18, 25	37	7	75.3	48.9	26.4	42	30	10	13
Indiana	Indiana	1,350	30.18	30.42	29.58	61.9	86	24	36	27	74.8	48.0	26.8	43	3	11	5
Lancaster	Lancaster,*	413	30.15	30.42	29.79	63.4	87	5	43	30	74.5	52.3	22.2	36	5	11	24
Lawrence	Newcastle	962	....	....	....	64.8	87	24	34	7	76.1	47.3	28.8	41	2	12	13
Lebanon	Lebanon,*	458	30.17	30.42	29.71	63.1	85	5	41	30	74.3	51.9	22.4	36	5	7	24

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MONTHLY SUMMARY OF REPORTS—*Continued.*

Counties	Stations	Elevation	Barometer reduced to sea level: Mean.	Barometer reduced to sea level: Highest.	Barometer reduced to sea level: Lowest	Temperature: Mean.	Temperature: Maximum: Highest.	Temperature: Maximum: Date.	Temperature: Minimum: Lowest.	Temperature: Minimum: Date.	Temperature: Mean maximum	Temperature: Mean minimum	Daily range: Mean.	Daily range: Greatest.	Daily range: Date.	Daily range: Least.	Daily range: Date.
Lehigh	Coopersburg	520				62.4	81	5	44	21	71.7	54.1	17.6	27	5,30	8	22,24
Luzerne	Drifton (26 days).*	1,683	30.19	30.40	29.79	58.7	77	5,19	40	8	68.5	48.9	19.6	32	30	7	1,22
Luzerne	Wilkesbarre.*	575				61.7	85	5	38	30	74.5	49.0	25.5	40	18	9	22
Lycoming	Williamsport																
McKean	Kane.*	2,000				57.9	79	23,24	35	17	68.8	47.1	21.7	36	2,17	6	5
McKean	Smethport.*	1,500															
Montgomery	Pottstown	150				64.4	86	5	44	30	75.6	53.2	22.4	34	3,5	10	22
Philadelphia	Weather bureau.*	117	30.18	30.42	29.70	66.8	86	5	51	2	75.5	58.0	17.5	28	5	7	22
Philadelphia	1529 Centennial avenue.*	120	30.18	30.42	29.69	67.1	88	5	49	30	76.6	57.6	19.0	29	5	7	22
Philadelphia	3301 Haverford street.*	120				66.3	86	5	48	30	75.6	57.0	18.6	29	5	7	22
Schuylkill	Girardville	1,000	30.10	30.30	29.76	61.2	79	5	43	30	70.9	51.8	19.1	30	30	8	22
Schuylkill	Pottstown (21 days)					62.3					79.0	45.7	33.3				
Snyder	Selinsgrove	455	30.14	30.37	29.81	63.2	88	12	29	30	75.6	45.5	30.1	50	30	11	8
Somerset	Somerset	2,250				61.8	87	4	34	2	75.8	47.8	28.0	51	2	4	9
Sullivan	Eagles Mere	2,060															
Tioga	Wellsboro	1,327	30.13	30.40	29.66	54.7	85	25	34	20	62.0	45.8	16.2	40	4	8	23
Union	Lewisburg.*	450	30.15	30.38	29.78	62.9	86	8,25	39	30	75.2	50.6	24.6	38	30	7	22
Warren	Columbus	1,410				59.9	85	4	34	17,29	72.4	47.4	25.0	46	29	7	13
Wayne	Dyberry	1,100				55.8	80	5,19	31	21,30	71.5	44.3	27.2	46	30	10	22
Wayne	Honesdale	1,000				58.3	78	25	35	30	68.8	47.7	21.1	36	30	6	1
Westmoreland	Ligonier (28 days)	1,750				63.1	88	24	37	6	78.9	47.3	31.6	45	3	17	20
Wyoming	South Eaton.*	660				60.9	80	5	37	30	71.5	50.3	21.2	37	30	8	22
York	York.*	385	30.14	30.38	29.78	64.0	88	5	41	7	76.2	51.8	24.4	38	5	10	24

* Observations taken at 8 a. m. and 8 p. m. † Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total.	PRECIPITATION. Snow.	PRECIPITATION. Number of days with rain.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	WIND. PREVAILING DIRECTION. 2 p. m.	WIND. PREVAILING DIRECTION. 9 p. m.
Allegheny,	Pittsburg,*	68.0	53.4	2.04	...	9	11	10	9	W	W	W
Berks,	Hamburg,	...	...	2.39	...	7	6	18	6	NW	...	E
Berks,	Reading,*	...	...	2.54	...	9	...	...	...	...	...	...
Blair,	Altoona,†	...	...	1.94	...	6	...	...	...	...	...	...
Blair,	Blue Knob,	...	...	4.62	...	9	10	9	11	NW	SE	SE
Blair,	Hollidaysburg,	78.5	55.0	2.48	...	5	14	9	7	W	W	W
Bradford,	Wysox,	84.0	54.7	1.48	...	8	16	7	7	SE	SW	SE
Bradford,	LeRoy,	...	...	2.04	...	7	10	10	10	SW	SW	SW
Bucks,	Hulmeville,*	...	...	...	...	...	...	...	...	...	...	...
Bucks,	Forks of Neshaminy (29 days),	...	...	3.13	...	6	19	6	4	N	E	E
Bucks,	Quakertown,	82.0	55.3	2.97	...	8	15	12	3	SE	SW	SE
Cambria,	Johnstown,*	...	...	1.60	...	10	10	15	5	S	...	S
Cameron,	Emporium,*	93.0	54.3	2.78	...	10	11	11	8	NW	...	W
Carbon,	East Mauch Chunk,	...	...	2.62	...	5	17	7	6	W	W	W
Centre,	State College,	76.7	53.6	2.23	...	11	12	10	8	W	S	W
Chester,	West Chester,	71.0	54.5	2.03	...	7	23	2	5	NE	E	E
Chester,	Coatesville,	...	...	3.15	...	7	19	4	7	W	W	W
Chester,	Kennett Square,*	...	...	3.17	...	7	22	3	5	NE	...	NW
Chester,	Phœnixville,*	81.6	56.6	2.14	...	9	17	3	10	NW	...	SE
Chester,	Westtown,	...	...	...	...	...	...	...	...	...	...	...
Clearfield,	Grampian,	...	...	2.12	...	6	19	4	7	SW	SW	E
Clinton,	Lock Haven,	...	...	1.34	...	5	16	4	10	W	W	W
Crawford,	Meadville,	...	...	...	...	...	...	...	...	...	...	...
Crawford,	Saegertown,*	...	...	3.44	...	11	14	10	6	S	...	S
Cumberland,	Carlisle,	87.7	56.3	4.85	...	7	17	7	6	SW	SW	SW
Dauphin,	Harrisburg,*	77.6	55.4	3.31	...	9	17	7	6	W	W	W
Delaware,	Swarthmore College,*	87.0	60.0	1.79	...	6	17	8	5	N	...	NW
Erie,	Erie,*	72.0	53.0	3.19	...	12	12	10	8	S	S	S
Fayette,	Uniontown,	...	...	2.21	...	6	22	6	2	...	...	...
Fulton,	McConnellsburg,	73.9	55.0	2.81	...	8	14	12	4	...	...	...
Huntingdon,	Huntingdon,*	...	...	2.81	...	8	18	3	9	W	...	W
Indiana,	Indiana,	79.0	51.5	2.75	...	8	10	13	7	W	W	W
Lancaster,	Lancaster,*	77.2	61.9	3.74	...	7	18	8	4	SW	...	SE
Lawrence,	Newcastle,	...	...	2.53	...	6	13	10	7	SE	SE	SE
Lebanon,	Lebanon,*	89.0	56 7	3.63	...	12	18	8	4	SW	...	SW

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MONTHLY SUMMARY OF REPORTS—*Continued.*

Counties.	Stations.	Relative humidity.	Dew point.	Precipitation. Total.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing Direction. 7 a. m.	Wind. Prevailing Direction. 2 p. m.	Wind. Prevailing Direction. 9 p. m.
Lehigh	Coopersburg	...	...	3.56	...	9	19	5	6	SW	SW	NE
Luzerne	Drifton (26 days).*	78.0	46.0	2.29	...	8	14	6	6	...	...	...
Luzerne	Wilkesbarre.*	...	...	2.51	...	7	22	1	7	NW	...	NW
Lycoming	Williamsport	...	...	...	...	...	...	...	...	...	...	...
McKean	Kane.*	...	...	2.86	...	7	20	1	9	SE	...	...
McKean	Smethport.*	...	...	...	...	...	...	...	...	...	...	...
Montgomery	Pottstown	78.0	55.5	2.33	...	5	24	1	5	W	W	W
Philadelphia	Weather bureau.*	74.6	55.9	2.06	...	6	16	9	5	SE	SE	SE
Philadelphia	1529 Centennial avenue.*	76.4	56.8	2.47	...	6	19	7	4	NE	...	SE
Philadelphia	3301 Haverford street.*	73.2	55.5	2.28	...	5	...	...	...	...	...	...
Schuylkill	Girardville	...	...	3.42	...	6	18	8	4	W	W	W
Schuylkill	Pottsville (21 days)	...	...	...	...	7	4	12	5	...	...	...
Snyder	Selinsgrove	84.5	58.9	3.29	...	8	5	17	8	NW	SW	SW
Somerset	Somerset	72.2	60.2	1.42	...	3	17	3	10	SE	SE	SE
Sullivan	Eagles Mere	...	...	...	...	...	...	...	...	...	...	...
Tioga	Wellsboro	79.4	68.5	1.18	...	5	10	5	15	N	N	N
Union	Lewisburg.*	80.5	52.6	2.57	...	8	19	4	7	S	...	S
Warren	Columbus	61.0	45.0	4.18	...	18	15	12	3	W	W	W
Wayne	Dyberry	...	...	2.10	...	6	17	7	6	W	W	W
Wayne	Honesdale	81.7	51.2	2.15	...	5	...	...	...	...	...	...
Westmoreland	Ligonier (26 days)	...	...	2.14	...	4	16	11	1	...	...	...
Wyoming	South Eaton.*	...	...	2.97	...	7	15	10	5	S	...	S
York	York.*	85.1	57.5	2.66	...	8	17	7	6	NW	...	NW

* Observation taken at 8 a. m. and 8 p. m.

† Observation taken at 12 noon.

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PRECIPITATION DURING SEPTEMBER, 1892.

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Costerville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian.	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.	Hulmeville.	Huntingdon.
1						.08																
2																						
3																						
4																						
5		.58				.54				.10	.37	.80			.85	.45		.72	.21	.41		.23
6	.10		.34	.60	.25	.09	.28	.34		.29		.12	.32	.89			.33	.24				.09
7																						
8		.20				.03	.01				.09	.06	.02									
9																						
10						1.19					.06	.39										
11						.08																
12															.83							
13	.02	1.80		.06	.64	1.15	.56	.04		.16	.47	.93		.14	1.10	.94	.15	.40	1.34	1.12		.83
14	1.08	.15	1.27	2.83	.52	.06	.50	.86	.34	.80	.28	.22	2.08			.10	.97	1.06	.23			.02
15		.70		.02	.02	.22					.04	.06					.03	.06				
16							.03	.06					.02	.06								
17		.20					.03										.28					.04
18																						
19						.06						.34										
20																						
21												.01				.05						
22	.37	.15	.42	.28	.50	.16	.44	.50	1.76	.59	.11	.04		.51	.43	.08	.29	.27	.82	.54		1.20
23	.19	.23	.19	1.00	.12		.08	.53			.05	.02	.61	.17				.35		.03		.15
24				.06							.52							.13				
25					1.10	.51	1.68	.08				.20	.08	.08	.17		.35		.29			.25
26	.18	.61				.01			.19	.16	.82				.04	.55		.08		.05		
27																						
28																						
29																						
30																						
Total	1.94	4.62	2.22	4.85	3.15	4.18	3.56	2.41	2.29	2.10	2.78	3.19	3.13	1.80	3.42	2.12	2.39	3.31	2.89	2.15		2.81

* United States Weather Bureau Stations.

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PRECIPITATION DURING SEPTEMBER, 1892—*Continued.*

DATE.	Indiana.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	LeRoy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Meadville.	Newcastle.	Oil City.	Philadelphia.*	Philadelphia, Centennial avenue.	Philadelphia, 2301 Haverford street.	Phœnixville.	Pittsburg.*
1	.60																				
2																					
3																					
4																					
5	.50	.27	.50				.18	.21	.27		.22		.37		.84						.60
6		.02		.24	.48		.39		.08	.55		.32	.04			.46	.28	.28	.31	.30	
7			.14			.40															
8		.01											.15		.12						
9							.01													.01	
10	.43		.85												.46						.40
11																				.02	.04
12																	.09	.13	.12		
13	.45	.42	.80	.20	.15		.30	.04	.38	.39	.39	.05	1.60				1.00	1.45	1.30	.15	11
14	.05	.10		.98	1.29	1.11	1.73	1.34	1.30	.17		1.88	.06		.62	.95				1.00	.24
15					.05		.04														
16	.05					.01	.02														.01
17		.01					.08		.02							.05				.02	
18																					
19								.10													
20																					
21		.08	.05																		
22		.05	.10	.30	.19	.40	.37	.12	.35		.15	.32	.42		.16	.58	.19	.13	.21	.42	.10
23	.06	.10		.39	.07		.16	.06	.06			.06	.07			.28	.47	.45	.34	.16	
24											.23					.05					
25			.42	1.02	1.51	.31	.35			1.03					.33	.30	.08	.03		.06	.40
26	.61	.54		.04			.02	.17	.16		.35										.14
27																					
28																					
29																					
30																					
Total	2.75	1.60	2.86	3.17	3.74	2.23	3.63	2.04	2.57	2.14	1.34	2.62	2.75		2.53	2.67	2.06	2.47	2.28	2.14	2.04

* United States Weather Bureau station.

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PRECIPITATION DURING SEPTEMBER, 1892—*Continued.*

DATE.	Point Pleasant.	Pottstown.	Pottsville.	Quakertown.	Reading.	Seegertown.	Seisholtzville.	Selinsgrove.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Westtown.	Wilkesbarre.	Williamsport.	Wysox.	York.
1.	...	...	...	...	...	.04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5.	...	.35	...	...	...	.51	...	.45	...	.47	.06	.28	...	.90	.05	...	...	.40	...	.23	.18
6.	...	...	...	.36	.40	...	...	.50	.36	...	.30	.01	.19	...	...	.27	...	...	...	...	.04
7.	...	...	...	...	...	.01	.44	...	...	...	...	...	...	...	...	...	...	...	...	.03	...
8.	...	...	...	...	...	.05	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...
9.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.03	...	...	...	...	...
10.	...	...	...	...	...	.94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	.64	...	...	.44	.01	1.25	.33	1.65	.02	.40	.09	.57	...	.14	.20	.37	...	...	...	.51	.58
14.	.75	1.20	...	.54	.75	.03	.56	.21	1.04	...	1.02	.19	.88	.23	.45	.72	...	1.35	...	...	1.19
15.	...	...	...	...	.02	.03	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...
16.	...	...	...	.06	...	...	.13	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17.	.20	...	...	.04	.15	...	...	.09	.12	...	...	.02	...	...	...	...	...	...	...	...	...
18.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.07	...	.02	...
20.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22.	.44	.40	...	.56	.20	.13	.45	.36	.56	...	.32	.65	.33	.41	...	.43	...	.35	...	.25	.25
23.	.77	.18	...	.11	.15	.02	.47	...	.93	...	.05	.10	.24	...	.08	.08	...	.04	...	.07	.32
24.	...	...	...	...	...	...	...	.02	...	...	...	.12	...	...	...	...	...	...	...	...	.06
25.	...	.20	...	.86	.85	.43	...	...	.16	...	...	...	.14	...	.40	.13	...	.25	...	.12	.05
26.	...	...	...	...	.01	...	...	.01	...	.55	.13	.27	.01	.34	...	...	...	.05	...	...	...
27.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total.	2.80	2.33	...	2.97	2.54	3.44	2.38	3.29	3.19	1.42	2.97	2.23	1.79	2.21	1.18	2.03	...	2.51	...	1.48	2.66

H. L. B.

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FOR OCTOBER, 1892.

General Remarks.

The prominent meteorological feature of the month was the marked deficiency in rainfall. During the whole month a serious drouth affected nearly the entire state, a few of the northwestern counties, only, received even a normal amount of rainfall.

In the central southern counties the total monthly fall was less than one-fourth of an inch. Elsewhere, less than one inch was recorded, except in the northwest.

The drouth did not seriously injure winter grain. Shortage in water supplies and favorable opportunity for forest fires were the most harmful effects. A high percentage of clear weather during the month, giving warm days and cool nights, was a consequence of the drouth, which was the most extensive on record for this state. Very little snow fell, the greatest amount occurring at Blue Knob.

Mean temperature and departure from normal:

October, 1888, mean 43°.1, 3°.0 below normal.
October, 1889, mean 47°.2, 4°.0 below normal.
October, 1890, mean 50°.9, 1°.0 below normal.
October, 1891, mean 50°.4, 1°.5 below normal.
October, 1892, mean 50°.5, 1°.4 below normal.

Mean precipitation:

October, 1888, 4.03 inches.
October, 1889, 3.85 inches.
October, 1890, 5.87 inches.
October, 1891, 3.06 inches.
October, 1892, 0.72 inch.

Temperature.

The mean temperature for October, 1892, was 50°.5, which is about 1°.4 below the normal, and 0°.1 above the corresponding month of 1891.

The mean of the daily maximum and minimum temperatures, 82°.3 and 39°.3, gives an average daily range of 23°.0, and a monthly mean of 50°.8.

Highest monthly mean, 57°.3 at Philadelphia (Centennial avenue).

Lowest monthly mean, 43°.2 at Wellsboro.

Highest temperature recorded during the month, 83°.0 on the 1st at Coatesville.

Lowest temperature, 16°.0 on the 25th at Wellsboro.

Greatest local monthly range, 59° at Wellsboro.

Least local monthly range, 37° at Erie.

Greatest daily range, 50° at Selinsgrove on the 3d.

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Least daily range, 3°.0 at Newcastle on the 29th and South Eaton on the 5th.

From January 1, 1892, to October 31, 1892, the deficiency in temperature at Philadelphia was 17°, at Erie 117° and at Pittsburg 107°.

Barometer.

The mean pressure for the month, 30.05, is about .02 inch below the normal. At the United States weather bureau stations, the highest observed was 30.48, at Harrisburg, on the 14th, and the lowest 29.44, at Erie, on the 29th.

Precipitation.

The average rainfall 0.72 inch for the month, is a deficiency of 2.44 inches. The largest monthly totals in inches were Sægertown, 2.93; Columbus, 2.79; Meadville, 2.41, and Kane, 2.32 inches.

The least were McConnellsburg, 0.00; Carlisle, 0.05; Altoona, 0.10; Huntingdon, 0.12; York, 0.14; Harrisburg, 0.15 and Reading, 0.20.

The prevailing wind was from the northwest.

Average number: Rainy days, 6; clear days, 13; fair days, 11; cloudy days, 7.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for October, 1892.*

County.	Station.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean of maximum.	Mean of minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg.*	820	30.08	30.42	29.66	54.0	78	18	33	6	63.5	44.6	18.9	32	14	7	29
Berks	Hamburg	380				52.3	82	1	26	31	64.4	39.3	25.1	41	7	13	18
Berks	Reading.*	280				49.9											
Blair	Altoona.†	1,181				55.6	78	1	40	22	63.7	47.5	16.2	28	3,14	6	26,27
Blair	Blue Knob	2,500				46.4	68	15	28	6	53.9	39.8	14.1	22	7,15	3	8
Blair	Hollidaysburg	947				49.9	78	14	21	31	64.5	32.6	31.9	45	3.15	13	27
Bradford	Wysox	718	30.04	30.45	29.54	46.7	74	14	27	2,31	59.0	36.0	23.0	39	11	8	26
Bradford	LeRoy	1,400				49.1	76	13	29	25	57.7	40.5	17.2	28	13	7	9
Bucks	Hulmeville.*																
Bucks	Forks of Neshaminy					52.8											
Bucks	Quakertown	536	30.07	30.48	29.63	49.0	78	1	27	31	63.4	38.8	24.6	37	7	11	18
Cambria	Johnstown.*	1,184	30.11	30.50	29.71	51.3	79	18	27	31	63.3	39.2	24.1	42	7	6	27
Cameron	Emporium.*	1,050	30.12	30.50	29.67	50.6	78	18	28	31	62.3	38.9	23.4	40	11	6	29
Carbon	East Mauch Chunk	550				50.5	78	14	24	31	62.3	38.4	23.9	38	11,22	9	5,30
Centre	State College	1,191	30.00	30.44	29.51	49.6	75	14	31	6	59.6	39.3	20.3	35	14	6	25,27
Chester	West Chester	455	30.01	30.43	29.56	52.5	79	1	33	6	64.0	43.9	20.1	31	7	9	18
Chester	Coatesville	380				49.8	83	1	27	27	67.6	37.8	29.8	43	7	9	19
Chester	Kennett Square.*	275				49.3											
Chester	Phœnixville.*	190	30.06	30.49	29.59	53.8	81	1	29	31	65.6	42.1	23.5	37	7	9	18
Chester	Westtown	350															
Clearfield	Grampian	1,450				47.3	72	1,14	30	24,25	57.7	36.5	18.2	34	11,12	4	26,27
Clinton	Lock Haven	560				49.6	79	15	27	31	64.1	36.2	27.9	41	14	7	5
Crawford	Meadville (27 days)	1,300				50.2	80	13	32	30	61.0	39.1	21.9	38	13	8	25
Crawford	Saegertown.*					47.1	76	15	25	31	59.6	34.6	25.0	43	13	8	9
Cumberland	Carlisle	480				49.9	79	1,14	30	25,31	65.2	39.7	25.5	40	7	15	13,28
Dauphin	Harrisburg.*	361	30.05	30.48	29.60	53.7	77	14	36	31	62.4	45.0	17.4	35	7	8	24
Delaware	Swarthmore College.*	190	30.04	30.40	29.65	54.3	80	1	31	6	64.8	43.9	20.9	31	10	8	6
Erie	Erie.*	681	30.03	30.41	29.44	52.0	75	18	38	31	59.0	46.0	13.0	27	18	4	16
Fayette	Uniontown (22 days)	1,000				53.0	78	1	31	31	62.9	43.1	19.8	39	3	7	29
Fulton	McConnellsburg	875				51.5	82	1,14	24	23,31	66.8	36.3	30.5	46	14	15	9
Huntingdon	Huntingdon.*	650				50.8	81	14	25	31	64.9	36.6	28.3	46	14	9	26
Indiana	Indiana (25 days)	1,350				49.2	76	16	24	24,30	63.7	36.5	27.2	38	14	15	26
Lancaster	Lancaster, F. & M. College.*	413	30.07	30.39	29.60	52.4	79	1	33	31	63.6	41.3	22.3	34	7	7	24
Lawrence	Newcastle	932				52.3	78	15	25	31	63.2	35.9	27.3	45	3	3	29
Lebanon	Lebanon.*	458	30.04	30.47	29.56	52.1	78	1	28	31	64.5	39.8	24.7	40	7	12	13

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Lehigh,	Coopersburg,	520	....	....	....	51.5	74	1	35	31	61.1	44.1	17.0	25	37	9	26
Luzerne	Drifton (26 days),*	1,683	30.01	30.38	29.56	48.7	72	14,15	28	31	59.4	38.0	21.4	37	3	9	28
Luzerne,	Wilkesbarre,*	575	....	....	....	50.5	75	15	27	31	62.5	38.6	23.9	38	11	10	9,17
Lycoming,	Williamsport,*	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
McKean,	Kane,*	2,000	....	....	....	48.2	74	13	27	2	58.6	37.8	20.8	33	2,12	7	9
McKean,	Smethport,*	1,500	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Montgomery,	Pottstown,	150	....	....	....	53.4	79	1	28	31	64.7	43.0	21.7	37	7	7	23
Philadelphia,	Weather bureau,*	117	30.08	30.45	29.58	56.4	79	1	36	6	65.0	47.9	17.1	29	14	8	30
Philadelphia,	1529 Centennial avenue,*	120	30.04	30.45	29.59	57.3	83	1	36	6	67.4	47.3	20.1	30	14	10	18
Philadelphia,	3301 Haverford street,*	120	....	....	....	55.3	79	1	34	6	64.4	46.2	18.2	29	7	9	30
Schuylkill,	Girardville,	1,000	30.01	30.34	29.61	49.0	72	14	29	31	59.7	39.4	20.3	31	11,14	7	9
Snyder	Selinsgrove,*	455	30.05	30.38	29.75	50.3	76	1	23	3,30	63.1	37.5	25.6	50	3	13	8,23
Somerset,	Somerset,	2,250	....	....	....	45.8	75	1	28	2	60.2	35.1	25.1	48	2	9	27
Sullivan,	Eagles Mere,	2,060	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tioga,	Wellsboro,	1,327	30.01	30.33	29.49	43.2	75	14	16	25	55.9	34.0	21.9	47	14	6	16
Union,	Lewisburg,*	450	30.07	30.45	29.72	50.6	77	14	24	25	63.7	37.6	26.1	42	11	11	8
Warren,	Columbus,	1,410	....	....	....	47.8	80	13	25	31	60.0	36.0	24.0	48	13	4	29
Wayne,	Dyberry,	1,100	....	....	....	44.4	76	14	22	31	58.4	33.5	24.9	41	11	6	25
Wayne,	Honesdale,	1,000	....	....	....	47.4	71	14	26	31	57.5	37.2	20.3	33	11	9	25
Westmoreland,	Ligonier (21 days),	1,750	....	....	....	50.2	79	1,13	28	21	63.4	32.2	36.2	48	1	24	5
Wyoming,	South Eaton,*	660	....	....	....	49.8	73	14,15	28	31	60.3	39.3	21.0	38	11	33	5
York,	York,*	385	30.01	30.38	29.66	2.3	81	1	26	31	65.6	38.8	27.0	46	7	14	5

* Observation taken at 8 a. m. and 8 p. m. † Observation taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station	Relative humidity.	Dew point.	Precipitation. Total.	Precipitation. Snow (inches).	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing direction. 7 a. m.	Wind. Prevailing direction. 2 p. m.	Wind. Prevailing direction. 9 p. m.
Allegheny	Pittsburg,*	64.2	40.0	0.51	T	7	9	10	12	NW	NW	NW
Berks	Hamburg,	...	...	0.37	...	4	5	23	3	NW	...	...
Berks	Reading,*	...	...	0.20	...	7	...	...	...	...	...	...
Blair	Altoona,†	...	...	0.10	...	1	...	...	...	...	...	...
Blair	Blue Knob,	...	...	1.42	2.5	8	12	13	6	NW	NW	NW
Blair	Hollidaysburg,	71.0	40.0	0.29	...	2	13	12	6	W	W	W
Bradford	Wysox,	83.0	41.0	1.02	...	6	7	8	16	NW	NW	NW
Bradford	LeRoy,	...	...	0.91	0.5	9	6	14	11	SW	SW	SW
Bucks	Hulmeville,*	...	...	...	...	...	...	...	...	...	...	...
Bucks	Forks of Neshaminy,	...	...	0.49	...	3	14	15	2	W	W	W
Bucks	Quakertown,	75.1	42.2	0.63	...	7	13	14	4	NW	NW	NW
Cambria	Johnstown,*	...	...	0.88	T	9	11	14	6	S	...	S
Cameron	Emporium,*	73.5	42.5	1.35	T	10	7	15	9	NW	...	W
Carbon	East Mauch Chunk,	...	...	0.82	...	7	17	12	2	W	W	W
Centre	State College,	71.8	40.4	0.28	...	5	10	9	12	W	W	W
Chester	West Chester,	61.0	38.5	0.36	...	5	22	6	3	W	NW	W
Chester	Coatesville,	...	...	0.48	...	4	17	11	3	W	W	W
Chester	Kennett Square,*	...	...	0.43	...	3	17	12	2	NW	...	NW
Chester	Phœnixville,*	75.6	43.4	0.35	...	4	9	11	11	NW	...	NW
Chester	Westtown,	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian,	...	...	0.59	...	9	6	15	10	W	W	W
Clinton	Lock Haven,	...	...	0.32	...	3	13	5	13	W	W	W
Crawford	Meadville (27 days),	...	...	2.41	T	9	5	10	12	SE	SW	SW
Crawford	Saegertown,*	...	...	2.93	T	16	10	8	13	NW	...	NW
Cumberland	Carlisle,	86.6	47.0	0.05	...	2	15	13	3	NW	SW	N
Dauphin	Harrisburg,*	72.6	42.6	0.15	T	4	14	14	3	W	W	W
Delaware	Swarthmore College,*	91.0	48.0	0.30	...	3	11	16	4	NW	...	NW
Erie	Erie,*	68.0	40.0	1.96	...	13	7	14	10	SW	SW	SW
Fayette	Uniontown (22 days),	...	...	1.05	...	4	13	6	3	NW	NW	NW
Fulton	McConnellsburg,	67.0	39.9	0.00	...	0	18	11	2	NW	W	NW
Huntingdon	Huntingdon,*	...	...	0.12	...	3	19	5	7	W	...	W
Indiana	Indiana (25 days),	79.0	44.0	1.02	...	2	7	12	6	W	W	N
Lancaster	Lancaster, F. & M. College,*	73.2	41.0	0.30	...	4	13	15	3	SW	...	W
Lawrence	Newcastle,	...	...	0.57	...	7	8	10	13	SW	SW	SW
Lebanon	Lebanon,*	82.4	42.4	0.29	T		17	13	1	SW	SW	SW

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Lehigh,	Coopersburg,	...	...	0.60	...	7	12	14	5	NW	NW	NE
Luzerne,	Drifton (26 days), *	76.0	41.0	1.38	...	5	12	8	6	...	...	...
Luzerne,	Wilkesbarre, *	...	...	0.72	...	5	19	2	10	W	...	W
Lycoming,	Williamsport, *	...	...	...	...	...	...	...	...	...	...	...
McKean,	Kane, *	...	...	2.32	...	13	15	...	16	SE	...	...
McKean,	Smethport, *	...	...	...	...	...	...	...	...	...	...	...
Montgomery,	Pottstown,	72.0	42.0	0.32	...	2	22	7	2	NW	NW	NW
Philadelphia,	Weather bureau, *	66.2	42.4	0.30	...	3	16	14	1	NW	NW	NW
Philadelphia,	1529 Centennial avenue, *	71.1	43.6	0.44	...	5	15	15	1	NW	...	NW
Philadelphia,	3301 Haverford street, *	70.1	43.4	0.48	...	4	...	...	...	...	...	...
Schuylkill,	Girardville,	...	...	0.41	...	6	14	10	7	NW	NW	NW
Snyder,	Selinsgrove, *	87.5	44.2	0.37	...	4	7	18	6	NW	...	NW
Somerset,	Somerset,	96.2	44.8	0.32	...	1	7	11	13	NW	NW	NW
Sullivan,	Eagles Mere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro,	80.1	31.0	0.38	...	5	6	10	15	N	SW	W
Union,	Lewisburg, *	83.4	36.8	0.22	...	8	10	15	6	S	...	S
Warren,	Columbus,	68.5	32.5	2.79	T	15	11	12	8	SW	SW	SW
Wayne,	Dyberry,	...	...	0.82	T	7	12	8	11	NW	NW	NW
Wayne,	Honesdale,	77.0	40.0	0.82	...	6	...	...	...	...	...	...
Westmoreland,	Ligonier (21 days),	...	...	0.51	...	2	11	10	...	...	...	...
Wyoming,	South Eaton, *	...	...	0.77	...	6	13	6	12	NW	...	NW
York,	York, *	79.3	42.7	0.14	T	2	17	11	3	NW	...	NW

* Observation taken at 8 a. m. and 8 p. m. † Observation taken at 12 noon.

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PRECIPITATION FOR OCTOBER, 1892.

DATE.	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus.	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Emporium.	Erie.	Forks of Neshaminy.	Frederick.	Girardville.	Grampian.	Hamburg.	Harrisburg.	Hollidaysburg.	Honesdale.
1	...	.08	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	...	...	...	...	.30	...	...	...	...	...	.18	...	...	...	...	...	...	...	...
4	.10	.31	...	...	...	.07	.10	...	.37	.16	.46	.04	.14	...	...	.15	...	.06	.27	.06
5	...	.10	...	...	...	.11	.17	...	.49	.20	.19	...	...	...	.06	...	.06	...	...	.26
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	...	.05	...	...	...	...	...	...	...	...	...	.04	...	...	...	...
8	...	...	...	.03	.30	.12	.10	.14	.10	.14	.06	.24	...	.10	.15	...	.13	...	...	.24
9	...	.60	.28	...	.07	...	.12	...	...	...	.02	.04	.30	.16	.04	...	...	.06	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	...	.13	...	...	...	...	...	.07	...	...	...	...	...	...	...	...
16	...	...	...	...	...	...	.03	...	...	.17	...	.05	...	...	.08	.05	.07	...	...	.15
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	...	...	...	...	.38	...	...	...	...	...	...	...	...	...	...	...
19	...	.13	...	...	.08	.22	.01	...	.04	.07	.06	.40	...	...	.04	.05	...	.01	...	.04
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	.03	...	...	...	...	.05	...	...	...	...	.03	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	...	.01	...	...	...	...	...	.03	...	...	...	...	...	...	...	...
24	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	...	...	...	...	...	.06	...	...	...	...	...	.08	...	...	...	...	...	...	...	...
26	...	.15	...	...	...	.26	...	...	...	.08	.09	.14	...	...	...	.14	...	...	...	...
27	...	.05	...	...	...	.02	...	...	...	...	.01	.16	...	...	...	...	...	...	.02	...
28	...	...	...	...	...	...	...	...	...	...	...	.05	...	...	...	...	...	...	...	...
29	...	.05	.05	.02	.08	1.33	.07	.08	...	.05	.37	.48	.05	.06	.04	.08	.11	.02	...	.08
30	...	...	...	...	...	.07	...	...	...	...	.04	...	...	...	...	.06	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	.10	1.42	.33	.05	.48	2.79	.60	.17	1.38	.82	1.35	1.96	.49	.32	.41	.59	.37	.15	.29	.82

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PRECIPITATION FOR OCTOBER, 1892—*Continued.*

DATE.	Hulmeville.	Huntingdon.	Indiana.	Johnstown.	Kane.	Kennett Square.	Lancaster.	Lansdale.	Lebanon.	Le Roy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Meadville.	Newcastle.	Ottsville.	Philadelphia, weather Bureau.	Philadelphia, 1529 Centennial avenue.
1	...	...	.12	.06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	...	.07	...	...	...	...	...	...	...	.16	...	.31	.20	...	...	...	.13	...	...	...
4	...	...	...	.36	.23	...	.02	...	.03	.18	.02	...	...	.22	...	.15	...	.04	...	...
5	...	...	...	.07	.17	...	...	...	.04	.12	.01	...	.01	.35	...	...	.05	.18	.04	.02
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.08
7	...	...	...	...	.10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	...	.01	...	.02	.09	.05	.05	...	.11	.03	.10	...	...	.04	...	.17	.11	...	...	...
9	...	...	...	.08	...	.33	.17	.30	...	.08	.01	...	...	.13	...	.15	.07	.26	.22	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.28
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	...	...	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	...	...	...	...	.30	...	...	...	...	...	...	...	.11	...	...	...	...	...	...	...
16	...	...	...	.12	...	...	...	...	.01	.23	.01	...	...	.01	...	...	...	...	...	...
17	...	...	...	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...
18	...	...	...	...	.08	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...
19	...	...	...	.07	...	...	...	...	...	...	.01	.21	...	...	...	.36	.12	...	...	.01
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
23	...	...	...	...	.06	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.06	...	...	...	...
25	...	...	...	...	.10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26	...	...	.20	.14	.22	...	...	...	...	.01	...	...	...	...	...	.70	.04	...	...	...
27	...	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	.17	...	...	...	...
28	...	...	...	...	.23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29	...	.04	...	...	.58	.05	.06	.25	.08	.10	.04	...	...	.06	...	.42	.05	...	.04	.05
30	...	...	...	.01	.11	...	...	...	...	...	...	...	...	...	...	.23	...	...	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	...	.12	1.02	.88	2.32	.43	.30	.55	.29	.91	.21	.52	.32	.82	...	2.41	.57	.48	.30	.44

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PRECIPITATION FOR OCTOBER, 1892—*Continued.*

DATE.	Philadelphia, 3301 Haverford street.	Phœnixville.	Pittsburg.	Point Pleasant.	Pottstown.	Quakertown.	Reading.	Saegertown.	Selinsgrove.	Selinsgrove.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Wilkesbarre.	Wysox.	York.
1			.04					.02								.27					
2																					
3								.03									.10		.10	.26	
4		.08	.16	.10		.08	.01	.14			.04	.32	.24	.13		.32	.05		.15	.42	
5	.10	.02				.06	.01	.08			.07		.07	.04				.02		.06	
6																					
7								.07													
8			.02		.25	.28	.10	.03	.37	.02			.06					.18	.06		.12
9	.32	.28	.08	.40		.10	.05	.08		.11	.29		.08		.28			.06			
10																					
11																					
12																					
13																					
14																					
15								.02											.36	.22	
16			.01			.02		.23	.10	.15			.24	.05			.10				.02
17																					
18																					
19	.01	.04	.19			.04	.01	.28		.09					.01	.37	.05	.06	.05		
20							.01														
21			.01											.04							
22								.02								.09					
23								.01													
24																					
25																					
26								.32													
27								.84													
28																	.08			.05	
29	.05			.50	.07	.05	.01	.59	.14		.05		.08	.02	.01			.04		.01	
30								.27													
31																					
Total	.48	.35	.51	1.00	.32	.63	.20	2.93	.61	.37	.45	.32	.77	.28	.30	1.05	.38	.36	.72	1.02	.14

H. L. B.

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FOR NOVEMBER, 1892.

General Remarks.

The temperature, for the first time since the establishment of the service, was slightly below the normal. The warmest periods were from the 1st to the 3d and from the 15th to the 18th, and the coldest from the 23d to the 27th. Generally the weather was mild and favorable to winter grain, which is reported as looking very well.

The drouth, which had prevailed throughout October, was entirely broken early in the month.

In the vicinity of Pittsburg and Newcastle the rainfall was below the normal. Elsewhere more than the usual amount occurred.

The snowfall was about the average. In the mountains the ground was covered for several days, but in the valleys and in the southern counties very little occurred. The greatest depth recorded was thirty-three and one-half inches at Blue Knob, one of the highest points in the state.

Mean temperature and departure from normal:

November, 1887, mean, 39°.2, about normal.
November, 1888, mean, 42°.0, 2°.4 above normal.
November, 1889, mean, 41°.0, 2°.3 above normal.
November, 1890, mean, 41°.5, 1°.9 above normal.
November, 1891, mean, 39°.6, about normal.
November, 1892, mean, 39.°1, 0°.5 below normal.

Mean precipitation:

November, 1887, 1.80 inches.
November, 1888, 3.37 inches.
November, 1889, 6.72 inches.
November, 1890, 1.49 inches.
November, 1891, 2.65 inches.
November, 1892, 4.34 inches.

Temperature.

The mean temperature for November, 1892, was 39°.1, which is about one-half degree below the normal, and 0°.5 below the corresponding month of 1891.

The mean of the daily maxima and minima temperatures, 46°2 and 31°.8, gives an average daily range of 14°.4 and a monthly mean of 39°.0.

Highest monthly mean, 44°.6 at Philadelphia, Centennial avenue.

Lowest monthly mean, 33°.6, at Blue Knob.

Highest temperature recorded during the month, 80°.0, on the 14th, at Columbus.

Lowest temperature, 10°.0 on the 23d and 24th, at Somerset.

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Greatest local monthly range, 54°.0 at Pittsburg, Hollidaysburg and Coatesville.

Least local monthly range, 40°.0 at Altoona and Harrisburg.

Greatest daily range, 41°.0 at Coatesville, on the 1st.

Least daily range, 1°.0 at Blue Knob on the 25th, and Columbus on the 8th.

From January 1, 1892, to November 30, 1892, the deficiency in temperature at Philadelphia was 66°, at Erie 197°, and at Pittsburg 195°.

Barometer.

The mean pressure for the month, 30.09, is about .04 above the normal. At the United States weather bureau stations, the highest observed was 30.47 at Harrisburg on the 9th, and the lowest 29.40 at Erie on the 17th.

Precipitation.

The average rainfall, 4.34 inches for the month, is an excess of three-fourths of an inch.

The largest monthly totals in inches were: Quakertown, 7.08; Phœnixville, 7.05; Philadelphia (Centennial avenue), 6.94, and Pottstown, 6.60.

The least were: Newcastle, 1.61; Pittsburg, 1.81; Kane, 2.37, and Meadville, 2.57.

Wind and Weather.

The prevailing wind was from the northwest.

Average number rainy days, 12; clear days, 6; fair days, 8; cloudy days, 16.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for November, 1892.*

County.	Stations.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean maximum.	Mean minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg,*	820	30.11	30.46	29.53	41.6	72	17	18	24	47.8	35.3	12.5	29	6	6	3
Berks,	Hamburg,	380	....	....	....	39.8	65	18	19	27	47.0	32.4	14.6	31	18	4	8, 28
Berks,	Reading,*	280	....	....	....	40.3	....	....	....	....	....	....	....	....	....	....	....
Blair,	Altoona (28 days),†	1,181	....	....	....	44.4	67	3	27	24, 25	51.2	37.6	13.6	24	5	5	16
Blair	Blue Knob,	2,500	....	....	....	33.6	59	1, 2	12	23	38.2	29.0	9.2	20	8, 18	1	25
Blair,	Hollidaysburg,	947	....	....	....	38.6	69	2	15	24	47.0	27.7	19.3	36	14	8	22, 26
Bradford	Wysox,	718	30.09	30.45	29.61	37.6	64	18	18	23	44.5	30.4	14.1	26	6	3	28
Bradford,	LeRoy,	1,400	....	....	....	35.5	60	2	16	23	41.4	29.6	11.8	26	18	4	28
Bucks.	Forks of Neshaminy,	....	....	....	....	41.7	....	....	....	....	....	....	....	....	....	....	....
Bucks,	Quakertown,	536	30.11	30.48	29.51	38.9	66	18	19	24	48.2	31.2	17.0	33	18	5	28, 29
Cambria	Johnstown,*	1,184	30.15	30.46	29.73	38.5	65	1	17	24	45.8	31.2	14.6	34	6	4	22, 29
Cameron	Emporium,*	1,050	30.08	30.46	29.63	38.3	63	2	20	24	45.0	31.7	13.3	26	17	4	26
Carbon,	East Mauch Chunk,	550	....	....	....	38.9	64	1	19	27	46.0	31.9	14.1	27	17	3	26, 28
Centre	State College,	1,191	30.04	30.43	29.47	37.4	64	2	15	23	42.7	30.6	13.1	26	1	5	26
Chester,	West Chester,	455	30.06	30.42	29.48	41.0	66	1	20	24	48.8	34.4	14.4	29	18	5	29
Chester	Coatesville,	380	....	....	....	39.8	71	1	17	23	50.8	30.1	20.7	41	1	8	26, 29
Chester,	Kennett Square,	275	....	....	....	39.6	....	....	....	....	....	....	....	....	....	....	....
Chester,	Phœnixville,	190	30.11	30.48	29.68	42.0	68	18	22	24	50.0	33.9	16.1	31	14	6	4
Chester,	Westtown,	350	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clearfield,	Grampian,	1,450	....	....	....	35.3	62	2	16	23	40.6	30.8	9.8	26	17	2	30
Clinton,	Lock Haven,	560	....	....	....	38.8	....	....	17	24	....	....	....	....	....	....	....
Crawford,	Meadville (28 days),	1,300	....	....	....	37.5	64	17	17	21, 24	44.4	30.6	13.8	26	21	5	22
Crawford,	Saegertown,*	....	....	....	....	36.6	64	17	17	23	43.9	29.7	14.2	34	17	4	28
Cumberland,	Carlisle,	480	....	....	....	39.1	64	17	20	24	48.1	32.2	15.9	34	17	3	28
Dauphin,	Harrisburg,*	361	30.10	30.47	29.56	40.6	62	2	22	24	46.6	34.5	12.1	27	17	3	26
Delaware,	Swarthmore College,*	190	30.07	30.45	29.68	42.8	68	3, 18	23	24	49.7	35.8	13.9	29	18	3	8
Erie,	Erie,*	681	30.05	30.43	29.40	39.0	66	17	23	23	45.0	34.0	11.0	24	17	4	29
Fayette,	Uniontown,	1,000	....	....	....	42.4	70	17	17	20, 24	48.8	36.0	12.8	32	17	2	29
Fulton.	McConnellsburg,	875	....	....	....	40.1	70	1	18	24	48.3	30.6	17.7	34	1	5	27
Huntingdon	Huntingdon,*	650	....	....	....	39.6	71	13	21	24	48.5	36.8	17.7	35	6	5	28
Indiana,	Indiana,*	1,350	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster,	Lancaster, Franklin and Marshall College,*	413	30.09	30.41	29.57	40.5	65	2	24	22, 24	48.0	32.9	15.1	32	17	7	25, 26
Lawrence,	Newcastle,	932	....	....	....	38.9	68	17	17	24	44.8	29.6	15.2	33	17	4	3, 28

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MONTHLY SUMMARY OF REPORTS—*Continued.*

Counties.	Station	Elevation.	Barometer Reduced to Sea Level.			Temperature.											
							Maximum.		Minimum.				Daily Range.				
			Mean.	Highest.	Lowest.	Mean.	Highest.	Date.	Lowest.	Date.	Mean of maximum.	Mean of minimum.	Mean.	Greatest.	Date.	Least.	Date.
Lebanon,	Lebanon.*	458	30.07	30.43	29.62	40.6	64	2	21	24	48.4	32.8	15.6	30	18	2	28
Lehigh,	Coopersburg,	520	....	....	....	39.8	64	18	20	27	43.5	33.3	15.2	27	14.18	7	5
Luzerne,	Drifton (24 days),	1,683	30.05	30.33	29.73	38.5	61	1	20	25	45.6	31.4	14.2	31	7	5	29
Luzerne,	Wilkesbarre.*	575	....	....	....	39.9	64	2,18	21	23,25	47.9	31.8	16.1	32	19	6	29
McKean,	Kane.*	2,000	....	....	....	34.1	56	1,2	12	23,24	42.2	26.1	16.1	27	14	3	4
McKean,	Smethport (27 days),	1,500	....	....	....	33.9	61	15	16	23,24	39.8	28.1	11.7	29	17	4	3 30
Montgomery,	Pottstown,	150	....	....	....	42.3	65	3,18	23	27	49.2	35.4	13.8	29	14	3	28
Philadelphia,	Weather Bureau,*	117	30.08	30.46	29.46	43.6	68	3	24	24	50.0	37.3	12.7	26	18	6	4
Philadelphia,	1529 Centennial avenue.*	120	30.09	30.46	29.46	44.6	69	3	24	24	51.6	37.6	14.0	26	18	6	26
Philadelphia,	3301 Haverford street (28 days).*	120	....	....	....	43.5	68	3	25	27	50.1	36.9	13.2	26	7	6	26
Schuylkill,	Girardville,	1,000	30.00	30.31	29.63	39.1	62	1	20	23,24	45.6	31.6	14.0	29	18	4	30
Snyder,	Selinsgrove,*	455	30.06	30.35	29.65	39.5	65	15	20	24	48.7	30.2	18.5	31	1	4	29
Somerset,	Somerset,	2,250	....	....	....	35.0	58	2	10	23,24	42.3	27.9	14.4	30	1,6	2	24
Sullivan,	Eagles Mere,	2,060	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tioga,	Wellsboro,	1,327	....	....	....	34.4	58	2	16	24	40.1	29.2	15.9	30	17	2	9
Union,	Lewisburg,*	450	30.08	30.25	29.63	39.8	63	16	18	21	48.8	30.8	18.0	32	23	3	26
Warren,	Columbus,	1,410	....	....	....	36.7	60	14	18	23,24	42.4	31.1	11.3	42	14	1	8
Wayne,	Dyberry,	1,100	....	....	....	34.3	59	3	11	27	40.4	27.4	13.0	36	7	3	16
Westmoreland,	Ligonier,	1,750	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wyoming,	South Eaton,	660	....	....	....	38.5	64	18	19	24	45.6	31.4	14.2	29	18	4	26
Wayne,	Honesdale,	1,000	....	....	....	35.7	61	16	15	27	42.8	28.7	14.1	32	7	5	25
York,	York,	385	30.06	30.43	29.55	40 9	67	1,3	17	24	49.6	32.3	17.3	36	1	3	28

*Observations taken at 8 a. m. and 8 p. m. †Observations taken at 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

COUNTY.	STATION.	Relative humidity.	Dew point.	PRECIPITATION. Total.	PRECIPITATION. Snow (inches).	PRECIPITATION. Number of days with rain.	NUMBER OF DAYS. Clear.	NUMBER OF DAYS. Fair.	NUMBER OF DAYS. Cloudy.	WIND. PREVAILING DIRECTION. 7 a. m.	WIND. PREVAILING DIRECTION. 2 p. m.	WIND. PREVAILING DIRECTION. 9 p. m.
Allegheny,	Pittsburg.*	72.2	32.6	1.81	2.0	19	8	5	22	NW	NW	NW
Berks,	Hamburg,	...	...	4.85	9.0	11	1	15	14	NW	W	NW
Berks,	Reading,*	...	...	5.41	...	12	...	...	...	...	...	...
Blair,	Altoona (28 days).†	...	...	2.69	...	12	...	...	...	...	...	...
Blair,	Blue Knob,	...	...	6.12	33.5	17	3	8	19	NW	NW	NW
Blair,	Hollidaysburg,	78.0	32.0	3.76	7.0	12	4	8	18	W	W	W
Bradford,	Wysox,	79.0	33.3	2.59	2.5	10	3	3	24	NW	NW	NW
Bradford,	LeRoy,	...	...	3.22	15.5	14	1	8	21	SW	SW	SW
Bucks,	Forks of Neshaminy,	...	...	6.77	...	8	8	11	11	W	W	W
Bucks,	Quakertown,	82.4	33.1	7.08	10.0	12	6	15	9	NW	NW	NW
Cambria,	Johnstown,*	...	...	4.74	9.0	21	3	4	23	S	...	S
Cameron,	Emporium,*	86.7	32.6	3.24	9.9	16	1	7	22	W	...	W
Carbon,	East Mauch Chunk,	...	...	6.09	6.2	11	12	7	11	W	W	W
Centre,	State College,	83.5	33.1	3.62	11.7	13	4	6	20	W	W	W
Chester,	West Chester,	70.0	31.5	6.05	2.2	13	12	5	13	NW	NW	NW
Chester,	Coatesville,	...	...	6.29	3.5	13	10	7	13	W	W	W
Chester,	Kennett Square,*	...	...	5.24	6.5	11	12	6	12	NW	...	SW
Chester,	Phœnixville,	77.9	33.4	7.05	T	13	7	6	17	NW	...	NW
Chester,	Westtown,	...	...	...	...	...	...	...	...	...	...	...
Clearfield,	Grampian,	...	...	3.21	13.0	13	2	7	21	W	W	W
Clinton,	Lock Haven,	...	...	3.35	5.5	11	8	7	15	W	W	W
Crawford,	Meadville (28 days),	...	...	2.57	14.7	15	0	6	22	SW	SW	SW
Crawford,	Segertown,*	...	...	3.97	16.1	19	2	4	24	SW	...	W
Cumberland,	Carlisle,	...	...	3.52	11.5	11	7	10	13	S	W	W
Dauphin,	Harrisburg,*	83.2	35.2	4.14	0.0	12	6	13	11	W	W	W
Delaware,	Swarthmore College,*	83.2	39.5	6.12	0.0	9	9	12	9	NW	...	NW
Erie,	Erie,*	78.0	32.0	3.03	0.0	21	1	6	23	NW	NW	NW
Fayette,	Uniontown,	...	...	3.50	5.2	12	9	6	10	NW	SW	NW
Fulton,	McConnellsburg,	74.1	31.8	3.76	12.5	10	7	11	12	NW	NW	NW
Huntingdon,	Huntingdon,	...	...	3.04	8.5	10	8	10	12	W	...	W
Indiana,	Indiana,	...	...	...	...	...	...	...	...	...	...	...
Lancaster,	Lancaster, Franklin and Marshall College,*	71.8	34.4	3.69	5.0	8	5	13	12	NW	...	NW
Lawrence,	Newcastle,	...	...	1.61	3.1	12	4	5	21	SW	SE	W
Lebanon,	Lebanon,*	85.7	34.2	4.55	10.7	11	7	11	12	NW	..	NW

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station	Relative humidity.	Dew point.	Precipitation. Total.	Precipitation. Snow (inches).	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing direction. 7 a. m.	Wind. Prevailing direction. 2 p. m.	Wind. Prevailing direction. 9 p. m.
Lehigh	Coopersburg	...	...	6.78	12.1	12	10	9	11	NW	NW	NE
Luzerne	Drifton (24 days).*	83.0	34.0	3.84	19.0	5	6	4	14	...	...	...
Luzerne	Wilkesbarre.*	...	...	4.37	7.0	10	10	3	17	SW	...	NW
McKean	Kane.*	...	...	2.37	...	8	14	0	16	SE	...	...
McKean	Smethport (27 days).*	...	...	...	...	...	...	...	...	SW	...	SW
Montgomery	Pottstown	76.7	34.3	6.60	2.5	10	14	5	11	NW	NW	NW
Philadelphia	Weather Bureau.*	72.9	34.3	5.71	0.0	11	9	8	13	NW	NW	NW
Philadelphia	1529 Centennial avenue.*	75.8	34.6	6.94	1.2	11	9	10	11	NW	...	NW
Philadelphia	3301 Haverford street (28 days).*	...	...	5.37	...	9	...	...	...	...	...	...
Schuylkill	Girardville	...	...	4.70	14.8	8	9	5	10	W	W	NW
Snyder	Selinsgrove.*	82.7	33.9	4.30	6.5	10	1	11	18	NW	...	NW
Somerset	Somerset	95.7	35.5	6.12	22.7	14	1	6	23	NW	NW	NW
Sullivan	Eagles Mere	...	...	...	...	...	...	...	...	...	...	...
Tioga	Wellsboro	82.4	29.3	2.55	8.1	8	4	5	21	SW	SW	W
Union	Lewisburg.*	84.5	32.3	3.94	3.5	14	9	6	15	NW	...	SW
Warren	Columbus	67.0	24.1	3.90	10.0	16	0	6	24	SW	SW	SW
Wayne	Dyberry	...	...	3.40	16.0	11	2	8	20	NW	NW	NW
Westmoreland	Ligonier	...	...	...	...	...	...	...	...	...	...	...
Wyoming	South Eaton	...	...	2.88	4.0	12	5	6	19	NW	...	NW
Wayne	Honesdale	...	...	4.62	16.0	12	...	...	...	...	...	...
York	York	88.5	35.4	4.44	8.5	11	13	5	12	NW	...	NW

* Observations taken at 8 a. m. and 8 p. m.

† Observations taken at 12 noon

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PRECIPITATION DURING NOVEMBER, 1892.

DATE	Altoona.	Blue Knob.	Brower's Lock.	Carlisle.	Coatesville.	Columbus	Coopersburg.	Doylestown.	Drifton.	Dyberry.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Girardville.	Grampian.	Hamburg.	Harrisburg.*	Hollidaysburg.	Honesdale.
1.	...	...	...	...	...	.32	...	...	...	...	.22	.25	...	...	...	.06	...	...	.01	.18
2.	.02	...	...	...	...	.38	...	...	...	.18	...	.47	...	...	...	.03	...	...	...	...
3.	.13	.36	...	.01	.17	.35	.12	.06	.63	.26	.07	.36	.07	.08	.42	.05	.06	.13	.23	.28
4.	.09	.30	.33	.08	.37	.40	.05	.24	...	.15	.05	.64	.31	.22	...	.06	.08	.12	.04	...
5.	...	.16	...	...	...	.07	...	...	...	...	.06	...	...	...	...	.12	...	...	...	...
6.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.13
7.	.04	.53	.04	.16	.06	.27	.08	.03	...	.20	.25	.24	...	.07	...	.68	.10	.06	.63	.36
8.	.30	...	...	...	.06	...	.02	.11	.13	...	.08	...	.12	.04	...	.05	.54	.07	.02	...
9.	...	.40	...	.05	.70	...	.90	.61	.50	.07	.08	.02	...	.71	.80	...	.92	.58	.68	.78
10.	.62	.25	1.81	1.45	.98	.44	1.25	1.14	...	.08	.33	.08	1.65	1.17	.29	.63	1.14	.88	.20	.18
11.	...	.05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12.	...	.05	...	...	...	...	...	...	...	...	.01	.08	...	...	...	...	...	...	...	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15.	.03	.23	1.58	.04	2.05	.14	2.23	2.41	.68	.05	.05	.01	...	1.87	.35	.05	.69	.25	.11	.60
16.	.08	.14	.81	.30	.16	.15	.45	.86	.66	.15	.11	.17	2.95	.71	.20	...	.20	.07	...	.08
17.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18.	1.06	1.96	.77	1.00	.86	.36	.74	.88	1.54	1.00	1.42	.06	.70	.87	1.30	.75	.96	1.30	1.32	1.01
19.	.08	.25	...	...	...	...	...	...	...	...	.03	.18	...	...	...	...	...	...	.03	...
20.	...	...	...	...	...	...	...	...	...	...	...	.16	...	...	...	...	...	...	...	...
21.	.04	.30	...	.01	.02	.29	...	.03	...	...	.12	.02	.01	...	...	...	...	.04	.07	.02
22.	...	.10	...	...	...	.11	...	...	...	...	...	.04	...	...	...	...	...	...	...	.02
23.	...	.60	...	...	.10	10	.01	...	...	...	...	.03	...	...	...	.16	...	...	...	...
24.	...	.20	...	...	...	...	...	...	...	...	...	.03	...	...	...	.08	...	...	...	...
25.	...	...	...	...	...	.06	...	...	...	...	...	.03	...	...	...	...	...	...	...	...
26.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28.	.20	.30	.66	.36	.60	.40	.74	.93	.75	.59	.35	.12	...	.75	.86	.47	.45	.42	.42	.98
29.	...	...	.39	.06	.16	.06	.19	.11	.65	.75	.01	.08	.96	.06	.48	...	.21	.22	...	...
30.	...	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...
Total.	2.69	6.12	6.39	3.52	6.29	3.90	6.78	7.51	5.74	3.48	3.24	3.03	6.77	6.55	4.70	3.21	4.85	4.14	3.76	4.62

* United States Weather Bureau stations.

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PRECIPITATION DURING NOVEMBER, 1892—*Continued.*

DATE.	Huntingdon.	Indiana.	Johnstown.*	Kane.	Kennett Square.	Lancaster.	Landsale.	Lebanon.	Le Roy.	Lewisburg.	Ligonier.	Lock Haven.	East Mauch Chunk.	McConnellsburg.	Meadville.	Newcastle.	Ottaville.	Philadelphia.*	Philadelphia, 1529 Centennial avenue.	Philadelphia, 8301 Haverford street.
1,	...	...	...	.63	...	...	...	...	.62	.01	...	.12	...	...	.44	.02	...	...	...	...
2,	...	...	.06	.09	...	...	...	...	.15	...	...	...	...	...	.20	.35	...	...	...	...
3,	.54	...	.64	.02	.07	.09	.05	.12	.02	.18	...	.12	.14	.10	.21	.06	.03	.04	.05	.03
4,	...	...	.05	.23	.45	.41	.28	.17	.16	.01	...	...	.04	.17	.20	...	.09	.34	.43	.41
5,	...	...	.05	...	...	...	...	...	.04	...	...	...	...	...	.13	.30	...	...	...	...
6,	...	...	...	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...
7,	.19	...	.42	...	.03	...	.05	.07	.06	.07	...	.20	.16	...	.18	.07	.03	...	...	...
8,	.17	...	.09	...	.05	...	...	...	.18	...	...	.36	.19	...	...	...	...	.06	.06	.07
9,	.30	...	.60	.60	.70	...	.95	.92	...	.39	...	.05	.49	.60	.05	...	1.00	.52	.78	.42
10,	.24	...	.43	...	.70	.80	.31	1.05	.35	.45	...	.29	1.03	.50	.21	.36	.90	.86	.90	.89
11,	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12,	...	...	.04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.04	...	...	...	...
15,	.05	...	.01	...	1.87	.69	3.78	.66	...	.15	...	.10	.41	.46	...	...	.83	2.00	2.37	2.02
16,	.08	...	.14	...	.21	.06	.29	.04	.17	.14	...	.11	1.46	.14	.10	...	2.28	.41	.53	.49
17,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18,	1.60	...	1.26	.15	.73	.99	.49	.88	1.81	.59	...	1.70	1.15	1.28	.11	.03	.78	.59	.71	...
19,	.05	...	.04	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...
20,	...	...	.07	...	...	...	...	...	...	...	...	...	...	...	.07	...	...	...	...	...
21,	...	...	.22	...	...	...	...	.08	.62	.05	...	...	...	.08	...	.02	...	.01	.01	...
22,	...	...	.01	...	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...	...
23,	...	...	.09	...	...	...	...	...	...	...	...	...	...	.05	.25	...	...	...	...	...
24,	...	...	.06	...	.02	...	...	...	...	...	...	...	...	...	.20	.08	...	...	...	...
25,	...	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27,	...	...	...	.60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28,	...	...	.43	...	.41	.48	.95	.41	.30	.53	...	.25	.61	.38	.16	.27	.70	.81	.97	.89
29,	...	...	.02	...	...	.17	...	.20	.12	.40	...	.05	.21	...	.06	.01	.19	.10	.15	.15
30,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total,	3.04	...	4.74	2.37	5.24	3.69	7.15	4.55	3.22	3.94	...	3.35	6.09	3.76	2.57	1.61	6.88	5.71	6.94	5.37

* United States Weather Bureau stations.

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PRECIPITATION DURING NOVEMBER, 1892—*Continued.*

DATE.	Phœnixville.	Pittsburg.*	Point Pleasant.	Pottstown.	Quakertown.	Reading.	Seegertown.	Selinsgrove.	Selinsgrove.	Smith's Corner.	Somerset.	South Eaton.	State College.	Swarthmore.	Uniontown.	Wellsboro.	West Chester.	Wilkesbarre.	Wysox.	York.
1.	...	.05	...	...	...	...	.39	...	...	...	...	.09	.05	...	.04	.05	...	...	.13	...
2.	...	.02	...	...	...	...	.19	...	...	...	...	...	.01	...	.05	.44	...	.10	.01	...
3.	.04	.08	...	.05	.04	.03	.31	...	.31	.09	.90	.15	.10	.07	.14	...	.04	.19	.07	.10
4.	.53	.07	...	.25	.13	.32	.25	.17	...	.13	.10	.09	...	.42	.06	.08	.34	...	.13	.40
5.	...	.04	...	...	...	...	.02	...	...	...	...	.07	...	...	...	...	...	.04	...	...
6.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7.	.06	.13	...	...	.12	.04	.25	.09	.20	.06	.25	.07	.35	...	.09	.20	.04	...	.09	.14
8.	.07	.01	...	.08	.28	.01	...	...	.21	.10	.20	.34	.11	...	...	...	.02	.78	...	.12
9.	.25	.10	.25	.75	.70	.71	.15	.78	...	.60	.75	.09	.42	...	.91	.02	.82	...	24	.57
10.	1.77	.36	1.27	1.40	1.42	1.29	.20	1.06	.29	1.45	.20	.40	.05	1.25	...	.10	.88	.77	...	.04
11.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.01	...
12.	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15.	1.90	...	2.71	...	2.46	1.30	.05	1.21	.01	2.50	.12	.06	.19	2.00	...	...	2.41	.67	.15	1.41
16.	.65	.08	.95	1.70	.33	.31	.10	1.42	1.10	.85	...	.14	.06	1.00	...	...	.20	...	...	.08
17.	...	...	...	.35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18.	.79	.27	.78	...	.88	.58	.27	.70	1.85	.77	2.13	.93	1.91	.57	.94	1.36	.67	1.19	1.42	1.14
19.	...	.04	...	.77	...	...	.02	...	...	...	.75	...	...	...	.40	...	...	...	...	...
20.	...	...	...	...	...	...	.12	...	...	...	.12	...	...	...	.16	...	...	...	...	...
21.	.01	.05	...	...	.04	.01	.12	...	.04	.03	.10	...	.05	.01	.22	...	.03	.01	...	...
22.	...	...	...	...	...	...	.17	...	...	...	...	...	...	...	...	...	...	.02	...	...
23.	.02	.14	...	...	...	...	.65	...	...	...	.07	...	...	...	...	...	.02	...	...	...
24.	...	.04	...	...	...	...	.15	...	...	...	.15	...	...	...	...	...	...	...	...	...
25.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
26.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
27.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
28.	.91	.26	.75	.85	.74	.44	.23	.89	.19	.88	.20	.45	.25	.75	.47	.30	.40	.60	.34	.35
29.	.25	.01	.14	.40	.19	.27	.03	.41	.10	.12	...	...	.07	.05	.02	...	.10	...	...	.19
30.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total.	7.05	1.81	6.85	6.60	7.28	5.41	3.97	6.73	4.30	7.58	6.17	2.88	3.62	6.12	3.50	2.55	6.05	4.37	2.59	4.44

* United States Weather Bureau stations.

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FOR DECEMBER, 1892.

General Remarks.

Until the 20th, the weather was mild and pleasant. Very little freezing weather has occurred, and the lack of snow was not injurious to the winter grain. During the third decade a protracted cold spell set in and continued through the month. Snow covered the ground in most places to a depth sufficient to protect grain.

The warmest days were the 7th and 8th, and the coldest the 27th, 28th and 29th.

Precipitation occurred on many days, but was generally light and the average for the month was considerably below the usual amount.

Following will be found a comparative statement of the monthly means of temperature and rainfall for each December since the establishment of the state service, and a statement of the yearly departure at three stations. This latter is of value as showing whether or not there has been received during the year, as a whole, a greater or less amount of temperature and rainfall than is usually received.

Mean temperature and departure from normal:

December, 1887, mean, 31°.3, 1°.5 above normal.
December, 1888, mean, 32°.6, 2°.6 above normal.
December, 1889, mean, 39°.3, 9°.3 above normal.
December, 1890, mean, 27°.5, 1°5 below normal.
December, 1891, mean, 38°.6, 8°.6 above normal.
December, 1892, mean, 27.°9, 2°.1 below normal.

From January 1, 1892, to December 31, 1892, the deficiency in temperature at Philadelphia was 160°, at Erie 3°.59, and at Pittsburg 334°, showing a cooler year than is usual.

Mean precipitation:

December, 1887, 3.53 inches.
December, 1888, 3.14 inches.
December, 1889, 2.77 inches.
December, 1890, 3.97 inches.
December, 1891, 4.09 inches.
December, 1892, 1.68 inches.

From January 1, 1892, to December 31, 1892, the deficiency in precipitation at Philadelphia was 5.89 inches, at Harrisburg 7.18 inches, Pittsburg 4.91 inches, and at Erie 1.15 inches, showing considerably less than the usual amount.

Temperature.

The mean temperature for December, 1892, was 27°.9, which is two degrees below the normal, and 10°.7 below the corresponding month of 1891.

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The mean of the daily maxima and minima temperatures, 34° 6 and 21°.0, gives an average daily range of 13°.6 and a monthly mean of 27°.8.

Highest monthly mean, 33°.3 at Philadelphia, Centennial avenue.

Lowest monthly mean, 22°.1, at Kane.

Highest temperature recorded during the month, 70°.0, on the 7th, at Pittsburg.

Lowest temperature, minus 13°.0, on the 27th, at Ligonier

Greatest local monthly range, 32°.0, at Ligonier.

Least local monthly range, 13°.0, at Honesdale.

Greatest daily range, 37°.0 at Sægertown on the 30th and 31st, Columbus on the 30th, and Ligonier on the 27th.

Least daily range, 1°.0, at Blue Knob on the 13th, and Salem Corners on the 1st.

Barometer.

The mean pressure for the month, 30.11, is about .05 inch above the normal. At the United States weather bureau stations the highest observed was 30.63 at Pittsburg on the 11th, and the lowest 29.52 at Erie on the 7th.

Precipitation.

The average precipitation, 1.60 inches for the month, is a deficiency of 1.31 inches.

The largest totals in inches were: Blue Knob, 4.37; Somerset, 3.32, and Sægertown, 2.90 inches.

The least were: Wellsboro, 0.40; Kane, 0.61, and Lewisburg, 0.70 inches.

The greatest amount of snowfall occurred at Blue Knob and Sægertown.

Wind and Weather.

The prevailing wind was from the northwest.

Average number: Rainy days, 9; clear days, 7; fair days, 9; cloudy days, 15.

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MONTHLY SUMMARY OF REPORTS *by Voluntary Observers of the Pennsylvania State Weather Service for December, 1892.*

County.	Station.	Elevation.	Barometer Reduced to Sea Level. Mean.	Highest.	Lowest.	Temperature. Mean.	Maximum. Highest.	Date.	Minimum. Lowest.	Date.	Mean maximum.	Mean minimum.	Daily Range. Mean.	Greatest.	Date.	Least.	Date.
Allegheny	Pittsburg,*	830	30.15	30.63	29.59	31.3	70	7	8	28	37.7	24.9	12.8	29	6	5	15
Berks,	Hamburg,	380	....	....	....	28.9	55	8	9	24	35.3	22.5	12.8	21	31	3	14
Berks	Reading,*	280	....	....	....	30.4	....	....	....	....	....	....	....	....	....	....	....
Blair,	Altoona,†	1,181	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Blair,	Blue Knob,	2,500	....	....	....	24.1	53	7	—8	26, 28	29.4	19.1	10.3	22	6, 12	1	13
Blair	Hollidaysburg,	947	....	....	....	28.9	53	8	0	28, 30	36.2	19.0	17.2	29	30	9	13
Bradford,	Wysox,	718	30.10	30.57	29.60	26.0	53	8	—7	27	31.9	19.0	12.9	22	16	2	5, 25
Bradford,	LeRoy,	1,400	....	....	....	24.1	50	8	—2	27	28.7	19.6	9.1	19	31	2	5
Bucks,	Forks of Neshaminy (29 days),	....	....	....	....	30.8	....	....	....	....	....	....	....	....	....	....	....
Bucks,	Quakertown,	536	30.11	30.63	29.61	28.3	61	8	2	21	35.5	20.3	15.3	30	21	4	5
Cambria,	Johnstown,*	1,184	....	....	....	28.6	63	7	—4	28	35.3	21.9	13.4	28	30	4	15
Cameron,	Emporium,*	1,050	30.10	30.66	29.54	24.8	51	8	—2	29	33.3	20.1	13.2	29	26	5	25
Carbon,	East Mauch Chunk,	550	....	....	....	27.5	50	8	3	27	34.1	20.8	12.3	24	21, 27	4	15
Centre,	State College,	1,191	30.07	30.59	29.50	26.6	50	8	—4	27	31.6	19.1	12.5	22	30	6	13, 15
Chester,	West Chester,	455	30.08	30.58	29.52	30.0	62	8	6	26	35.9	23.2	12.7	19	6, 8	3	17
Chester,	Coatesville,	380	....	....	....	29.0	63	8	5	29	38.3	20.8	17.5	27	3	5	13
Chester,	Kennett Square,*	275	....	....	....	28.0	....	....	....	....	....	....	....	....	....	....	....
Chester,	Phœnixville,*	193	30.11	30.63	29.61	30.4	64	8	6	27, 29	37.6	23.2	14.4	25	21	5	17
Chester,	Westtown,	350	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clearfield,	Grampian,	1,450	....	....	....	24.5	48	7 8	0	28, 30	29.9	19.5	10.4	26	6	2	20
Clinton,	Lock Haven,	560	....	....	....	27.2	52	8	—5	27	34.6	18.8	15.8	31	27	5	12
Columbia,	Bloomsburg,*	500	30.16	30.49	29.47	28.3	60	8	—1	27	35.1	21.5	13.6	23	30	7	7
Crawford,	Meadville,	1,300	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Crawford,	Saegertown,*	....	....	....	....	24.6	62	7	—11	30	33.0	15.6	17.4	37	30, 31	4	19
Cumberland,	Carlisle,	480	....	....	....	28.4	60	8	3	27	36.9	21.5	15.4	25	3	4	14
Dauphin,	Harrisburg,*	361	30.11	30.61	29.66	30.8	62	8	9	24	36.2	25.5	10.7	21	8	3	15
Delaware,	Swarthmore College,*	190	30.08	30.58	29.65	28.4	63	8	8	28	37.2	24.3	12.9	25	31	5	15
Erie,	Edinboro,	....	....	....	....	25.8	....	....	....	....	....	....	....	....	....	....	....
Erie,	Erie,*	681	30.10	30.57	29.52	28.0	63	7	5	26	33.0	23.0	10.0	29	7	3	2
Fayette,	Uniontown,	1,000	....	....	....	31.3	68	7	—5	28	38.4	24.3	14.1	28	6	4	1, 20
Fulton,	McConnellsburg,	875	....	....	....	30.6	62	8	4	30	39.6	21.6	18.0	26	30	6	13
Huntingdon,	Huntingdon,*	660	....	....	....	29.2	55	8	—1	27	37.2	21.1	16.1	30	27	5	18
Indiana,	Indiana,	1,350	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Juniata,	Kilmer,	....	....	....	....	32.5	61	8	4	27	....	....	....	....	....	....	....
Lancaster,	Lancaster, F & M Coll. (15 days),*	413	30.10	30.61	29.60	....	64	8	....	....	....	....	....	....	....	....	....

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Lawrence,	Newcastle	962				29.2	68	7	−5	28, 30	35.6	19.3	16.3	30	28	7	23
Lebanon,	Lebanon,*	458	30.07	30 58	29.57	29.9	61	8	3	27	36.9	22.8	14.1	23	3, 20	3	14
Lehigh,	Coopersburg,	530				29.2	59	8	5	27	38.0	23.1	14.9	23	21, 27	7	5, 22
Luzerne,	Drifton (26 days),*	1,683	30.09	30.57	29.71	28.6	51	8	1	27	34.2	23.5	11.2	29	31	4	15
Luzerne,	Wilkesbarre *	575				28.6	57	8	2	27	35.2	21.9	13.3	29	24	6	15
McKean,	Kane,*	2,000				22.1	51	7	−2	24	29.2	15.0	14.2	29	12		3
McKean,	Smethport (30 days),*	1,500				23.8	50	8	−5	29	30.7	16.9	13.8	32	29	5	4
Montgomery,	Pottstown,	150				30.8	64	8	7	27	37.1	24.4	12.7	20	9, 27	2	13
Philadelphia,	Weather Bureau,*	117	30.09	30.62	29.56	32.8	64	8	10	27	38.0	27.5	10.5	23	8	4	17
Philadelphia,	1529 Centennial avenue,*	120	30.09	30.62	29.58	33.2	64	8	10	27	38.9	27.5	11.4	21	8	4	17
Philadelphia,	4301 Haverford street,*	120				32.0	63	8	10	27	37.1	26.9	10.2	20	8	2	17
Pike,	Blooming Grove,*					25.2											
Schuylkill,	Girardville,	1,000	30.04	30.57	29.50	29.4	52	8	2	27	34.3	21.3	13.0	24	7	9	12, 22
Snyder	Selinsgrove,	455	30.08	30.53	29.70	28.0	46	8	2	27	35.1	20.9	14.2	23	28	6	4
Somerset,	Somerset,	2,250				25.8	64	8	−10	28	33 8	17.1	16.7	32	8	4	15
Sullivan,	Eagles Mere,	2,060															
Tioga,	Wellsboro,	1,327	30.19	30.60	29.58	24.7	46	8	−9	27	30 5	18 2	12.3	24	31	1	19
Union	Lewisburg,*	450	30.08	30.56	29.70	28.4	49	8	0	27	35.5	21.2	14.3	20	10, 29	6	13, 22
Warren,	Columbus,	1,410				25.1	56	7	−8	29	31.5	16.3	18.6	37	31	3	4
Wayne,	Dyberry,	1,100				22.6	41	8	−5	27	29.1	14.6	14.5	29	8, 31	3	7
Wayne,	Honesdale,	1,000				24.7	42	8	−1	27	31.2	18.2	13.5	28	31	4	15
Wayne,	Salem Corners,	1,600				23.1	46	6	−1	27	28.0	18.5	19.5	24	6	1	1
Westmoreland,	Ligonier,	1,750				27.3	69	7	−13	27	37.4	17.7	19.7	37	27	8	15, 20
Wyoming,	South Eaton,*	660				26.2	50	8	−3	27	32.9	19.4	13.5	27	20	4	1
York,	York,*	385	30.06	30.59	29.59	28.8	65	8	1	29, 30	37.2	20.4	16.8	27	3	5	17

*Observations taken at 8 a. m. and 8 pm. †Observations taken 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station.	Relative humidity.	Dew point.	Precipitation. Total.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing Direction. 7 a. m.	Wind. Prevailing Direction. 2 p. m.	Wind. Prevailing Direction. 9 p. m.
Allegheny	Pittsburg,*	75.8	24.6	1.92	4.05	17	3	7	21	NW	NW	NW
Berks	Hamburg	...	...	1.33	5.00	4	1	20	10	NW	...	...
Berks	Reading,*	...	...	1.46	...	13	...	...	...	...	...	...
Blair	Altoona,†	...	...	...	...	...	...	...	...	...	...	...
Blair	Blue Knob	...	...	4.37	16.5	15	4	10	17	NW	NW	NW
Blair	Hollidaysburg	...	...	1.97	6.0	6	6	13	12	W	W	W
Bradford	Wysox	81.0	20.1	1.28	1.0	6	3	3	25	NW	NW	NW
Bradford	Le Roy	...	...	0.98	4.6	12	1	13	17	SW	SW	SW
Bucks	Forks of Neshaminy (29 days)	...	...	1.75	..	7	11	13	5	W	W	W
Bucks	Quakertown	...	...	1.95	1.5	7	7	13	11	NW	NW	NW
Cambria	Johnstown,*	...	...	2.51	6.5	22	6	8	17	S	...	S
Cameron	Emporium,*	86.3	21.1	0.94	2.9	11	6	8	17	NW	...	W
Carbon	East Mauch Chunk	...	...	1.26	2.2	6	12	6	13	N	N	N
Centre	State College	86.8	22.9	1.07	7.1	12	4	14	13	W	W	W
Chester	West Chester	73.5	23.2	2.39	7.0	9	14	3	14	NW	NW	NW
Chester	Coatesville	...	...	2.52	7.2	9	13	6	12	W	W	W
Chester	Kennett Square,*	...	...	2.59	5.5	9	13	5	13	N	...	NW
Chester	Phœnixville,*	83.4	23.4	2.00	5.0	11	4	12	15	NW	...	NW
Chester	Westtown	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian	...	...	1.36	8.0	13	3	8	20	W	W	W
Clinton	Lock Haven	...	...	1.35	9.3	9	7	6	18	W	W	W
Columbia	Bloomsburg,*	76.9	21.2	0.94	3.1	10	2	17	12	NW	...	W
Crawford	Meadville	...	...	...	...	...	...	...	...	...	...	...
Crawford	Saegertown,*	...	...	2.90	22.7	16	...	8	20	W	...	NW
Cumberland	Carlisle	...	...	1.45	5.5	9	6	13	9	NW	NW	W
Dauphin	Harrisburg,*	78.6	24.3	1.17	3.0	10	7	12	12	NW	NW	NW
Delaware	Swarthmore College,*	83.0	25.0	1.21	3.0	3	7	16	8	NW	...	NW
Erie	Edinboro	...	...	...	...	...	...	...	...	...	...	...
Erie	Erie,*	81.0	24.0	1.60	...	21	1	12	18	SW	SW	SW
Fayette	Uniontown	...	...	1.55	7.0	7	11	10	10	SW	SW	SW
Fulton	McConnellsburg	76.5	24.0	1.55	7.0	6	7	16	9	N	N	N
Huntingdon	Huntingdon,*	...	...	1.55	4.2	7	12	8	11	W	...	W
Indiana	Indiana	...	...	...	...	...	...	...	...	...	...	...
Juniata	Kilmer	...	...	1.39	4.7	9	...	...	...	...	...	...
Lancaster	Lancaster, Franklin and Marshall College (15 days),*	...	...	0.51	1.0	5	5	5	5	W	...	NW

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Lawrence,	Newcastle,	...	...	1.02	7.5	12	0	12	19	NW	SW	W
Lebanon,	Lebanon,*	89.5	24.2	1.96	5.9	11	10	13	8	SW	...	NW
Lehigh,	Coopersburg,	...	...	1.74	5.2	7	12	7	12	NW	NW	SW
Luzerne,	Drifton (26 days),*	83.0	22.0	1.20	3.0	3	8	5	13	...	...	...
Luzerne,	Wilkesbarre,*	...	...	1.53	6.0	8	13	1	17	NW	...	NW
McKean,	Kane,*	...	...	0.61	...	3	19	...	12	NW	...	...
McKean,	Smethport (30 days),*	...	...	...	...	...	1	17	12	SW	...	SW
Montgomery,	Pottstown,	69.0	22.0	1.94	5.5	6	18	4	8	NW	NW	NW
Philadelphia,	Weather Bureau,*	70.4	24.4	2.09	3.6	10	6	12	13	NW	NW	NW
Philadelphia,	1529 Centennial avenue,*	73.6	23.5	2.31	3.5	10	8	11	12	NW	...	NW
Philadelphia,	3301 Haverford street,*	75.6	24.5	1.96	2.8	7	11	8	12	NW	...	NW
Pike,	Blooming Grove,*	...	...	...	...	...	...	...	...	...	...	...
Schuylkill,	Girardville,	...	...	2.03	7.7	7	8	12	11	NW	NW	NW
Snyder,	Selinsgrove,	83.5	24.0	1.90	4.7	6	6	15	10	NW	NW	NW
Somerset,	Somerset,	93.1	25.1	3.33	12.5	12	2	2	27	NW	NW	NW
Sullivan,	Eagles Mere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro,	81.7	24.2	0.40	1.0	5	2	8	21	N	NW	NW
Union,	Lewisburg,*	...	...	0.70	4.6	5	4	10	17	W	...	S
Warren,	Columbus,	71.0	14.0	2.05	8.0	16	1	10	20	SW	SW	SW
Wayne,	Dyberry,	...	...	1.76	4.5	5	5	10	16	NW	NW	NW
Wayne,	Honesdale,	...	...	1.72	4.0	11	...	...	...	...	...	...
Wayne,	Salem Corners,	...	...	2.18	6.6	8	0	9	22	W	W	W
Westmoreland,	Lagonier,	...	...	2.12	5.0	4	10	2	19	...	...	...
Wyoming,	South Eaton,*	...	...	0.86	...	8	2	8	21	NW	...	NW
York,	York,*	92.1	24.9	2.13	8.0	9	11	10	10	NW	...	NW

* Observations taken at 8 a. m. and 8 p. m. † Observations taken 12 noon.

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MONTHLY SUMMARY OF REPORTS—*Continued.*

County.	Station	Relative humidity.	Dew point.	Precipitation. Total.	Precipitation. Snow.	Precipitation. Number of days with rain.	Number of Days. Clear.	Number of Days. Fair.	Number of Days. Cloudy.	Wind. Prevailing Direction. 7 a. m.	Wind. Prevailing Direction. 2 p. m.	Wind. Prevailing Direction. 9 p. m.
Allegheny	Pittsburg,*	75.8	24.6	1.92	4.05	17	3	7	21	NW	NW	NW
Berks	Hamburg	...	...	1.33	5.00	4	1	20	10	NW	...	...
Berks	Reading,*	...	...	1.46	...	13	...	...	...	...	...	...
Blair	Altoona,†	...	...	...	...	...	...	...	...	...	...	...
Blair	Blue Knob	...	...	4.37	16.5	15	4	10	17	NW	NW	NW
Blair	Hollidaysburg	...	...	1.97	6.0	6	6	13	12	W	W	W
Bradford	Wysox	81.0	20.1	1.28	1.0	6	3	3	25	NW	NW	NW
Bradford	Le Roy	...	...	0.98	4.6	12	1	13	17	SW	SW	SW
Bucks	Forks of Neshaminy (29 days)	...	...	1.75	...	7	11	13	5	W	W	W
Bucks	Quakertown	...	...	1.95	1.5	7	7	13	11	NW	NW	NW
Cambria	Johnstown,*	...	...	2.51	6.5	22	6	8	17	S	...	S
Cameron	Emporium,*	86.3	21.1	0.94	2.9	11	6	8	17	NW	...	W
Carbon	East Mauch Chunk	...	...	1.26	2.2	6	12	6	13	N	N	N
Centre	State College	86.6	22.9	1.07	7.1	12	4	14	13	W	W	W
Chester	West Chester	73.5	22.2	2.39	7.0	9	14	3	14	NW	NW	NW
Chester	Coatesville	...	...	2.52	7.2	9	13	6	12	W	W	W
Chester	Kennett Square,*	...	...	2.59	5.5	9	13	5	13	N	...	NW
Chester	Phœnixville,*	82.4	23.4	2.00	5.0	11	4	12	15	NW	...	NW
Chester	Westtown	...	...	...	...	...	...	...	...	...	...	...
Clearfield	Grampian	...	...	1.36	8.0	13	3	8	20	W	W	W
Clinton	Lock Haven	...	...	1.35	9.3	9	7	6	18	W	W	W
Columbia	Bloomsburg,*	76.9	21.2	0.94	3.1	10	2	17	12	NW	...	W
Crawford	Meadville	...	...	...	...	...	...	...	...	...	...	...
Crawford	Saegertown,*	...	...	2.90	22.7	16	...	8	20	W	...	NW
Cumberland	Carlisle	...	...	1.45	5.5	9	6	13	9	NW	NW	W
Dauphin	Harrisburg,*	78.6	24.3	1.17	3.0	10	7	12	12	NW	NW	NW
Delaware	Swarthmore College,*	83.0	25.0	1.21	3.0	3	7	16	8	NW	...	NW
Erie	Edinboro	...	...	...	...	...	...	...	...	...	...	...
Erie	Erie,*	81.0	24.0	1.60	...	21	1	13	18	SW	SW	SW
Fayette	Uniontown	...	...	1.55	7.0	7	11	10	10	SW	SW	SW
Fulton	McConnellsburg	76.5	24.0	1.55	7.0	6	7	16	9	N	N	N
Huntingdon	Huntingdon,*	...	...	1.55	4.2	7	12	8	11	W	...	W
Indiana	Indiana	...	...	...	...	...	...	...	...	...	...	...
Juniata	Kilmer	...	...	1.39	4.7	9	...	...	...	...	...	...
Lancaster	Lancaster, Franklin and Marshall College (15 days),*	...	...	0.51	1.0	5	5	5	5	W	...	NW

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Lawrence,	Newcastle,	...	...	1.02	7.5	12	0	12	19	NW	SW	W
Lebanon,	Lebanon,*	89.5	24.2	1.96	5.9	11	10	13	8	SW	...	NW
Lehigh,	Coopersburg,	...	...	1.74	5.2	7	12	7	12	NW	NW	SW
Luzerne,	Drifton (26 days),*	88.0	22.0	1.20	3.0	3	8	5	13	...	...	...
Luzerne,	Wilkesbarre,*	...	...	1.53	6.0	8	13	1	17	NW	...	NW
McKean,	Kane,*	...	...	0.61	...	3	19	...	12	NW	...	...
McKean,	Smethport (30 days),*	...	...	...	...	...	1	17	12	SW	...	SW
Montgomery,	Pottstown,	69.0	22.0	1.94	5.5	6	18	4	8	NW	NW	NW
Philadelphia,	Weather Bureau,*	70.4	24.4	2.09	3.6	10	6	12	13	NW	NW	NW
Philadelphia,	1529 Centennial avenue,*	73.6	23.5	2.21	3.5	10	8	11	12	NW	...	NW
Philadelphia,	3301 Haverford street,*	75.6	24.5	1.96	2.8	7	11	8	12	NW	...	NW
Pike,	Blooming Grove,*	...	...	...	...	...	...	...	...	...	...	...
Schuylkill,	Girardville,	...	...	2.02	7.7	7	8	12	11	NW	NW	NW
Snyder,	Selinsgrove,	88.5	24.0	1.90	4.7	6	6	15	10	NW	NW	NW
Somerset,	Somerset,	98.1	25.1	3.82	12.5	12	2	2	27	NW	NW	NW
Sullivan,	Eagles Mere,	...	...	...	...	...	...	...	...	...	...	...
Tioga,	Wellsboro,	81.7	24.2	0.40	1.0	5	2	8	21	N	NW	NW
Union,	Lewisburg,*	...	...	0.70	4.6	5	4	10	17	W	...	S
Warren,	Columbus,	71.0	14.0	2.05	8.0	16	1	10	20	SW	SW	SW
Wayne,	Dyberry,	...	...	1.76	4.5	5	5	10	16	NW	NW	NW
Wayne,	Honesdale,	...	...	1 72	4.0	11	...	...	...	...	...	...
Wayne,	Salem Corners,	...	...	2.18	6.6	8	0	9	22	W	W	W
Westmoreland,	Ligonier,	...	...	2.12	5.0	4	10	2	19	...	...	...
Wyoming,	South Eaton,*	...	...	0.86	...	8	2	8	21	NW	...	NW
York,	York,*	92.1	24.9	2.18	8.0	9	11	10	10	NW	...	NW

* Observations taken at 8 a. m. and 8 p. m. † Observations taken 12 noon.

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PRECIPITATION DURING DECEMBER, 1892.

DATE.	Altoona.	Bloomsburg.	Blue Knob.	Brookville.	Brower's Lock.	Carlisle.	Clarion.	Coatesville.	Columbus.	Confluence.	Coopersburg.	Davis Island Dam.	Doylestown.	Drifton.	Du Bois.	Dyberry.	Emporium.	Erie.*	Forks of Neshaminy.	Frederick.	Freeport.	Girardville.	Grampian.	Greensboro.	Hamburg.	Harrisburg.*
1,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3,	...	.01	.60	.11	...	.01	.04	.01	.10	.01	.01	.43	...	...	.05	...	...	.02	.03	...	.15	...	.04	.05	...	.02
4,	...	...	.10	.04	...	...	.01	...	...	...	...	...	...	...	...	.09	.02	.02	...	...	...	...	...	...	...	...
5,	...	...	...	...	...	...	...	...	...	...	...	.07	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6,	...	.15	.57	...	...	.01	...	...	.31	...	...	...	...	...	...	...	.05	.06	.01	...	.10	...	.17	.10	...	.04
7,	...	.04	.53	.21	.04	.36	.20	.08	.05	.21	...	.82	...	.10	.35	.32	.12	.06	...	...	.95	...	.13	.16	...	.12
8,	...	.21	.40	.11	.18	.16	.21	.28	.20	...	.68	.15	.24	.78	.05	.97	.19	.22	.37	.41	...	.82	.15	...	.69	.26
9,	...	...	.05	...	...	...	...	...	...	...	...	...	...	.32	.02	...	...	.04	...	...	...	...	...	...	...	...
10,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	...
11,	...	.12	.35	.17	...	...	.06	...	.16	...	...	...	...	...	.09	...	...	.10	...	...	.08	...	.08	.08	...	...
12,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13,	...	.16	...	...	...	.30	...	.88	.09	.03	.38	.05	.72	...	...	.28	.20	.06	...	.49	...	.36	.01	.06	.19	.36
14,	...	...	.64	.29	1.07	.40	.26	.36	.37	1.15	.30	.59	.11	...	.35	...	.31	.15	.95	.40	.65	...	.32	.55	...	.26
15,	...	...	...	.05	...	...	.03	...	...	.05	...	.01	...	...	.07	...	.02	.01	...	...	.05	...	...	...	...	...
16,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17,	...	...	...	...	.19	.06	.01	.15	...	.11	...	...	...	...	...	...	...	...	.06	.02	...	...	...	.10	...	.03
18,	...	...	.05	...	...	...	...	...	.02	.05	...	...	...	...	...	...	.05	.02	...	...	.03	...	.04	...	...	...
19,	...	...	...	.02	...	...	.01	...	.05	...	...	...	...	...	.07	...	.02	.07	...	...	...	.09	...	...	...	...
20,	...	.17	.35	.01	.45	.05	.03	.49	.03	.12	.26	.09	.48	...	...	...	...	.08	.38	.29	.15	.12	.04	.25	.11	.08
21,	...	...	.05	...	...	...	.05	...	.10	.01	...	.01	...	...	.04	...	...	.17	...	...	...	...	...	...	...	...
22,	...	...	.05	...	...	...	.01	...	.15	.05	...	...	...	...	.12	...	...	.03	...	...	...	.40	...	.01	...	...
23,	...	.02	.08	...	...	...	.03	...	.15	.02	...	...	...	...	.10	...	.01	.19	...	...	.04	...	.10	...	...	...
24,	...	...	.10	.21	...	...	.16	...	.10	.11	...	...	...	...	.15	...	...	.01	...	...	.03	.45	.02	.10	...	...
25,	...	.05	.15	.11	.06	...	.18	.22	.15	.04	.09	.05	.15	...	.05	.10	.04	.22	.05	.07	.03	...	.12	...	.04	.02
26,	...	...	...	.31	...	.10	.10	...	...	.10	...	.10	...	...	.15	...	...	...	...	...	.15	...	...	.10	...	...
27,	...	...	...	...	...	...	.20	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...
28,	...	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29,	...	.01	...	...	...	...	.01	...	.02	...	...	...	...	...	...	...	...	.04	...	...	.02	...	...	...	...	...
30,	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31,	...	...	.30	...	.06	...	...	.10	...	...	.03	...	...	...	...	...	...	...	...	...	...	.14	.04	...	...	.04
Total.	...	.94	4.37	1.65	2.05	1.45	1.62	2.52	2.05	2.06	1.74	2.88	1.76	1.20	1.66	1.76	.94	1.68	1.75	1.71	2.48	2.02	1.36	1.51	1.33	1.17

* United States Weather Bureau stations.

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PRECIPITATION DURING DECEMBER, 1892—*Continued.*

DATE.	Hollidaysburg.	Honesdale.	Huntingdon.	Indiana.	Johnstown.	Kane.	Kennett Square.	Kilmer.	Lancaster (15 days.)	Lansdale.	Lebanon.	LeRoy.	Lewisburg.	Ligonier.	Lock Haven.	Lock No. 4.	Mahoning.	East Mauch Chunk.	McConnellsburg.	Newcastle.	Oil City.	Otterville.	Parker's Landing.	Philadelphia.*	Philadelphia, Centennial avenue.	Philadelphia, Haverford street.
1.	...	.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3.	...	.01	...	...	.05	...	...	...	...	...	.02	.58	.01	...	.09	.06	.12	...	...	.05	.07	...	.08	.01	.01	...
4.	...	.01	...	...	...	...	...	...	...	...	...	.10	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6.	.50	.15	.05	...	.37	.05	...	...	.02	...	.04	...	.06	1.00	.08	.02	...	...	...	.08	...	...	...	...	...	...
7.	.24	.08	.29	...	.35	.21	.08	...	.12	...	...	.03	...	...	...	.36	.20	.04	.24	.42	.28	...	.32	...	...	...
8.	...	1.02	.06	...	.02	...	.14	...	.30	.26	.06	.25	.27	...	.18	.01	.19	.69	...	...	.10	.47	.20	.25	.24	.18
9.	...	...	...	...	.01	...	...	...	...	...	.64	...	...	...	...	...	.01	...	...	...	.08	.18	.05	...	...	...
10.	...	...	...	...	.03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...
11.	...	...	...	...	.04	...	...	...	...	...	...	...	...	...	...	.13	.04	...	...	...	.02	...	.09	...	...	...
12.	...	.37	...	...	...	...	...	...	...	...	.02	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	...
13.	.65	.01	.35	...	.63	.35	.70	...	.05	.75	...	.05	.23	1.05	.25	.08	...	.18	.48	...	...	.74	...	.56	.67	.67
14.	.28	...	.61	...	.35	...	.50	...	.02	.12	.60	.11	...	.05	...	.72	.42	.14	.35	.27	.26	...	.34	.52	.52	.40
15.	...	...	...	...	.08	...	...	...	...	...	.20	...	...	.02	...	...	.02	...	...	...	.02	...	.02	...	...	...
16.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.03	...	...	...
17.	...	.01	...	...	.02	...	.11	...	...	...	...	...	...	...	.05	.02	...	...	.10	...	...	...	...	.09	.10	.09
18.	...	...	...	...	.02	...	...	...	...	...	.02	...	...	...	...	...	.01	...	...	.01	...	...	.02	...	...	...
19.	...	.02	...	...	.03	...	...	...	...	...	...	...	...	...	.30	...	...	...	...	...	.02	...	.31	...	...	...
20.	.13	...	.10	...	.07	...	.06	...	...	.35	...	.08	...	...	...	.33	.12	.12	.28	.04	...	.25	.06	.56	.59	.57
21.	...	...	...	...	.02	...	...	...	...	...	.26	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...
22.	...	...	...	...	.10	...	...	...	...	...	...	...	.13	...	.10	.02	...	...	...	...	.01	...	.01	...	...	...
23.	...	...	...	...	.05	...	...	...	...	...	...	.08	...	...	...	...	.02	...	...	.07	.02	...	...	...	...	...
24.	...	...	...	...	.03	...	...	...	...	...	...	...	...	...	.30	...	.10	...	...	...	.10	...	.16	.02	.01	...
25.	...	.08	...	...	.10	...	.25	...	...	.09	.05	.06	...	...	...	.08	.01	.09	...	.08	...	.15	.08	.04	.04	.04
26.	...	...	...	...	.01	...	.08	...	...	...	...	...	...	...	...	.11	.12	...	...	.01	.02	...	.16	.01	.01	...
27.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.10	.02	...	...	...	...	...	...	...	...	...
28.	...	...	...	...	...	...	...	...	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	...	...	...	...
29.	...	...	...	...	.02	...	...	...	...	...	...	.02	...	...	...	...	...	...	...	...	...	...	...	...	...	...
30.	...	...	...	...	...	...	...	...	...	...	...	.02	...	...	...	.01	...	...	...	...	...	...	...	...	...	...
31.	.07	...	.09	...	.10	...	.07	...	...	...	.05	...	...	...	...	.20	...	...	.20	.02	...	...	...	.01	.02	.01
Total.	1.97	1.72	1.55	...	2.51	.61	2.59	1.39	.51	1.57	1.96	.98	.70	2.12	1.35	2.17	1.39	1.26	1.55	1.02	.95	1.79	1.63	2.09	2.21	1.96

* United States Weather Bureau stations.

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PRECIPITATION DURING DECEMBER, 1892—*Continued.*

DATE.	Phoenixville.	Pittsburg.*	Point Pleasant.	Pottstown.	Quakertown.	Reading.	Ridgway.	Seagertown.	Salem Corners.	Saltsburg.	Selsholtzville.	Sellingrove.	Smith's Corner.	Somerset.	South Eaton.	State College.	Stoyestown.	Swarthmore.	Uniontown.	Warren.	Wellsboro.	West Chester.	West Newton.	Wilkesbarre.	Wysox.	York.
1.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3.	.02	.05	...	...	...	.01	.04	.08	...	.02	...	.65	...	...	...	.02	...	...	.06	.04	...	.02	.07	.06	.05	.01
4.	...	...	.02	...	...	...	...	...	.10	...	...	...	...	...	...	...	...	...	...	.08	...	...	...	...	...	...
5.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.07	...	...	...	...	...	...
6.	...	.46	...	...	.06	.01	...	.16	...	...	...	...	...	.16	.06	.01	...	...	.18	...	...	.02	.04	.06	.20	...
7.	.02	.45	...	...	...	.02	.18	.06	...	1.25	...	.05	...	.67	.15	.11	...	...	...	.18	.02	.20	.44	.67	.03	.05
8.	.35	.07	.35	.50	64	.55	.21	...	1.09	.05	1.17	.55	.66	...	.11	.08	...	...	...	.83	.12	...	.06	.78	.30	.87
9.	...	...	...	...	...	.01	.01	...	.23	...	...	...	...	...	...	...	...	...	...	.04	...	...	...	...	...	...
10.	...	...	...	...	...	...	...	...	...	...	...	...	...	.30	...	...	...	...	...	...	...	...	...	...	...	...
11.	...	.01	...	...	...	...	.04	.20	...	...	...	...	...	...	...	.01	.20	.30	...	.11	...	...	.10	...	...	...
12.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.60	...	...	.04	...	.84	...	...	...	...
13.	.32	.47	.40	.35	.35	.30	...	.13	...	...	.03	.09	.45	.80	.20	.04	.13	...	.62	...	...	.56	.08	...	.20	.69
14.	.47	.04	.20	.60	.36	.30	.21	.34	.40	.66	...	.49	.40	.13	.15	.19	...	.61	...	.25	.10	...	.74	.26	...	.26
15.	...	.01	...	...	...	...	.04	...	...	...	...	...	...	...	...	.06	...	...	...	.05	.10	...	...	...	...	...
16.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.09	...	...	.13	...	...	...	...
17.	.18	...	...	...	.21	.01	...	...	...	...	...	...	...	...	...	...	.05	...	...	...	...	...	.03	...	...	.08
18.	...	...	...	...	...	...	...	.04	...	.02	...	...	...	.05	...	.01	...	...	...	.04	...	...	...	...	...	...
19.	...	.02	...	...	.35	...	...	.10	...	...	...	...	...	...	...	...	...	...	...	...	...	.44	.20	...	.50	...
20.	.48	.57	.60	.35	...	.16	.01	.02	.28	.15	.35	.09	.35	.17	.09	.08	.30	...	.14	.01	...	...	...	...	...	.57
21.	...	.01	...	...	...	...	...	.08	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.04	.15	...	...
22.	...	.01	...	...	...	...	.01	.12	...	...	...	...	...	.06	...	...	.10	...	...	.08	...	...	...	...	...	...
23.	...	...	...	...	...	...	.01	.71	...	.01	...	...	...	...	.10	.05	...	.30	...	.32	...	...	.10	.10	...	...
24.	.01	.01	...	...	...	.01	...	.10	.10	.08	...	...	...	.14	...	...	...	...	...	...	...	.13	...	...	...	...
25.	.11	.15	.30	.10	.04	.05	.02	.58	.01	...	.16	...	.13	.40	...	...	.50	...	.20	.09	.06	...	.10	.05	...	...
26.	.02	.02	...	...	...	.01	.04	.16	.05	.20	...	...	...	...	.01	...	.30	...	...	.11	...	...	...	...	...	...
27.	...	...	...	...	...	...	...	.05	...	...	...	...	...	...	...	...	...	...	...	.18	...	...	.20	...	...	...
28.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.01	...	...	...	...	...	...
29.	...	.04	...	...	...	...	...	...	...	...	...	...	...	.12	...	...	...	...	...	...	...	...	...	...	...	...
30.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
31.	.02	.06	...	.34	...	.04	.22	...	...	...	.04	...	...	.32	...	.05	...	...	.26	...	...	.05	...	...	...	.10
Total,	2.00	1.92	1.87	1.94	1.95	1.46	1.04	2.90	2.18	2.39	2.35	1.90	1.69	3.32	.76	1.07	2.13	1.21	1.55	2.36	.95	3.39	2.23	1.53	1.23	2.13

*United States Weather Bureau stations.

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APPENDIX I.

CORRESPONDENCE AND LEGAL OPINIONS.

Letter of the Secretary to B. K. Ryder Co., *re* Apple Pomace.
From L. A. Freeman, Superintendent of Public Schools, Shenandoah, Relative to Dangerous Condition of School.
From Dr. Heber Roberts, Butte, Montana, Undrawn Fowls.
To DeWitt Smith, Chairman on Legislation, American Live Stock Association, Springfield, Ill., Sanitary Legislation.
From J. G. Shoemaker, Health Officer, Phœnixville, Swearing in Members of Health Board.
From Dr. A. F. Balmer, Brookville, Repairing School House.
Legal Opinions—
Collins *v.* The Chartiers Valley Gas Company.
Alfred Lee, Esq., Removal of Dam.
Alfred Lee, Esq., Public and Private Nuisances

LETTER OF SECRETARY TO B. K. RYDER CO., IN RE APPLE POMACE.

December 5, 1891.

The B. K. RYDER CO., *Chambersburg, Pennsylvania:*

GENTLEMEN: Referring to your two favors of November 30th, one of which was addressed to Harrisburg and the receipt of which has been acknowledged by postal card, requesting the advice of our Board with regard to an accumulation of pomace in connection with your cider mill, I would say, first, that as the members of our Board are scattered through the entire State it was quite impossible for me either to call a meeting of the Board or to communicate with them by letter in sufficient time to reply at length before the date fixed by you, namely, December 2d. Secondly, our Board is not in the habit of interfering in the slightest degree with the orders of local authorities for the abatement of nuisances. We are only too much gratified when we find municipal authorities ready to appreciate the responsibility which rests upon them for protecting the public health.

Thirdly, it is not our function to advise the manner in which the nuisance shall be abated, nor are we willing to give advice in such form

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that parties charged with committing a nuisance can shelter themselves by the statement that they have adopted the means suggested by our Board.

With these preliminary statements I may give you the expression of my personal opinion. First, that apple-pomace in its fresh state is not liable to produce disease, and is a valuable food for stock, which is the best possible disposition that can be made of it. Secondly, that in a condition of fermentation and especially of decomposition it may become so offensive as to interfere with the digestions of those who constantly breathe the emanations from it, and by interfering with the free ventilation of houses in the immediate neighborhood may in that way be prejudicial to the health of their inmates. It is a great mistake, therefore, to allow it to accumulate in the neighborhood of human habitations. Thirdly, the accumulation having taken place and fermentation and decomposition having set in, the treatment by lime is probably the best that you can use; but it should be done on such a generous scale as to completely neutralize the unpleasant odors outside of your establishment.

I rely upon you not to publish any portion of this communication without publishing it entire.

Yours respectfully,

BENJAMIN LEE,
Secretary.

FROM L. A. FREEMAN, SUPERINTENDENT OF PUBLIC SCHOOLS, OF SHENANDOAH, ON DANGEROUS CONDITION OF PUBLIC SCHOOL.

SHENANDOAH, PA., *March 9, 1892.*

BENJAMIN LEE, M. D., *Secretary State Board of Health:*

DEAR SIR: In reply to yours of the 8th instant, just received, I will say that for a long time cracks have been noticed in the brick walls and in the foundation walls of the White Street school building, and the stone foundation or cellar walls have bulged out, owing to the fact, recently discovered, that they were not properly bound when built.

About two months ago the board undertook to strengthen these walls by means of iron rods and plates. When this work was finished, I found that the condition of the building was worse than before, the jarring of the walls consequent upon the drilling of holes through them for the admission of the iron rods probably having weakened the walls and caused some bulging of the brick work above. At this time, also, the defect in the construction of the stone foundation was revealed. I considered the situation alarming, and advised the board to remove the

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schools and have the building examined by an expert. The board adopted my recommendation, and appointed a committee consisting of the president, secretary and myself to secure the services of an expert. Finding there was a civil engineer on the State Board of Health, we concluded he was there for the purpose of meeting just such emergencies as ours.

Mr Murphy came and, after making a cursory examination of the building, expressed the opinion that the board had acted wisely in removing the pupils, and that the foundation walls were not properly constructed. He requested the president of the board to furnish him with a survey of the building upon which he would base a full report to be submitted to the board. He said that upon reaching home he would send a preliminary report justifying the board in its present course pending the preparation of the survey and the full report. The survey has been begun, and the board is awaiting the preliminary report promised. I have stated this to Mr. Murphy in reply to a despatch received from him last Saturday evening.

Yours respectfully,
L. A. FREEMAN.

FROM DR. HEBER ROBERTS, BUTTE, MONTANA. (UNDRAWN FOWLS.)

BUTTE CITY, MONT., *March 7, 1892.*

Dr. LEE:

DEAR DOCTOR: We have failed to pass an ordinance prohibiting fowls offered for sale undrawn. Claim is made drawn fowls spoil and cannot be shipped. This, though, has been proved erroneous as one shipper has received them from Nebraska monthly.

Undrawn fowl, I contend, when two to twelve weeks old, are unfit for human consumption, unless kept constantly frozen throughout this period. Here they are kept permitted to thaw and freeze as ice and climate are favorable, and held for sale many weeks in a hard or soft, discolored, limpid, condition. When placed to the nose but little or no order is detected with skin intact.

I believed fish, fowl and meat alike, post mortem, generate within the flesh noxious germs, the product of which are the alkaloids, or ptomaines, which are mortal when hypodermatically used.

Second, The microbal generation within the intestine produces ptomaines which are by proximity taken up by the flesh.

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Third, The nutritious portion of the flesh is deteriorated by specific products resulting from microbal disintegration of the muscular, nervous and vascular system.

1. Are the three propositions above in accordance with the facts?
2. Are dead fowls six weeks undrawn wholesome?
3. Are fowls of equal disintegration as wholesome undrawn as drawn?
4. Are fowls such as described above wholesome?
5. Do you believe law should restrict undrawn poultry from the market?
6. May the consumption of undrawn fowls cause sickness?
7. Is the nutriment of a fowl four weeks undrawn deteriorated though not decayed?
8. Is undrawn poultry more favorable to the growth of pathogenic microbes than drawn?

These questions are for the benefit of man and I therefore solicit your written opinion.

HEBER ROBARTS,
Health Officer.

REPLY OF THE SECRETARY.

April 21, 1892.

DR. HEBER ROBERTS, *Health Officer, Butte City, Montana:*

DEAR DOCTOR: Referring to your note of inquiry of the 18th inst. I would say that the best evidence that I have been able to obtain on the subject favors the view that undrawn poultry is better for shipping than drawn, for the reason that the visceral cavity when exposed to the air takes on putrefaction more rapidly than when closed. Besides this, drawn fowls prevent one from ascertaining the condition of the alimentary tract which is important if chicken cholera is prevalent.

The bacteria of putrefaction would develop earlier in the open fowl than any bacteria inherent with the fowl would develop in the closed cavity.

Yours very truly,

BENJ. LEE,
Secretary.

SANITARY LEGISLATION.

April 20, 1892.

MR. DEWITT SMITH, *Chairman, Committee on Legislation, American Live Stock Association, Springfield, Illinois:*

DEAR SIR: Replying to your esteemed favor of the 31st inst., requesting suggestions concerning state and national legislation for sanitary purposes, I would say, that in the first place, it will be necessary to shape national legislation as far as possible, so that while it will be effective, it shall not interfere with the provisions of the various States and the

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regulations of their Boards, whether of health or of agriculture having the same objects in view.

Secondly, That it is highly desirable that the states should adopt stringent regulations for the management of herds, the care of dairies and the protection of dairy products from a sanitary point of view.

Thirdly, That the foundation of all such legislation should be the systematic observation of herds by legally appointed officers.

Fourthly, That the right to condemn and slaughter animals discovered to be affected with contagious diseases should be conveyed to appropriate responsible officers, and

Fiftly, That from a sanitary point of view the principal of compensation for animals thus slaughtered for the protection of the public health should be incorporated in all such acts, for the reason that in this way the temptation to concealment will be entirely obviated.

I have the honor to be,

Yours respectfully,

BENJAMIN LEE,
Secretary.

FROM DR. J. G. SHOEMAKER, HEALTH OFFICER, PHŒNIXVILLE.

[Swearing in Members of Health Board.]

THE BOARD OF HEALTH OF THE BOROUGH OF PHŒNIXVILLE,
PHŒNIXVILLE, PA., *May 5, 1892.*

DR. BENJAMIN LEE,

DEAR DOCTOR: Will you kindly inform me if the members of the board of health are sworn into office, if not, is the health officer sworn in? We have had some discussion on this point and would like to hear from you.

Very truly yours,

J. G. SHOEMAKER, M. D.,
Health Officer, Phœnixville.

REPLY OF THE SECRETARY.

May 16, 1892.

DR. J. G. SHOEMAKER, *Health Officer, Phœnixville, Pa.:*

DEAR DOCTOR: I have to apologize for allowing your favor of the 5th inst., to go so long unacknowledged. At the time of its arrival, however, I was just preparing for a regular meeting of the Board which engrossed my entire time.

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If Phœnixville is a city, there can be no question at all that the members of the board as well as the health officer should be sworn in. If it is a borough, there is no law upon the subject, unless it be found in the special act of assembly incorporating the borough. I shall be compelled to refer you on this point to your borough solicitor, who is familiar with the details of your charter. Of course it is quite competent for your council to declare by ordinance that the officers referred to should be required to take the usual oath. My feeling would be that it would be wise to have matters so arranged that an oath should be taken, as it not only binds the officer to the discharge of his duties, but gives him prestige and authority in the eyes of the people. He can always fall back upon the fact that he has taken a solemn oath as a justification for insisting vigorously on the carrying out of his orders.

Always holding myself at your service in any matter in which I can aid you officially, I am,

Yours fraternally,

BENJAMIN LEE,
Secretary.

FROM DR. A. F. BALMER, BROOKVILLE. PAPERING OF SCHOOL WALLS.

BROOKVILLE, PA., *June 3, 1892.*

DR. BENJ. LEE, *Secretary State Board of Health:*

DEAR SIR: Please give me your opinion as to papering the walls of school rooms, as regards the hygiene of the same.

Our school board has been thinking some of doing so, but believing that it is not conducive to health I thought I would write you for your opinion. Please let me know at your earliest convenience as we expect to have action on the matter soon. Let us know also what are the best books on school hygiene.

Yours sincerely,

A. F. BALMER,
President School Board.

REPLY OF THE SECRETARY.

June 22, 1892.

DR. A. F. BALMER, *President School Board, Brookville, Pa.*

DEAR DOCTOR: Your favor of the 3d instant arriving during my absence in attending the National Conference of State Boards of Health at Lansing, Michigan, hence the delay in replying to it.

With regard to papering the walls of school rooms, I would say that

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I entirely sustain your opinion that it would not be conducive to the health of the pupils. Where large numbers of individuals are crowded comparatively into a small room, the ventilation of which is often imperfect, and where the germs of disease are often unavoidably present, paper very soon becomes saturated with the exhalations from the lungs and pores of the skin, and thus becomes a vehicle for the propagation of disease. I take the liberty of sending you a few copies of our circulars on school hygiene. In country school houses whitewash is undoubtedly the best coating for the walls. Next to that a hard paint or glaze which will stand washing.

Yours very truly,

BENJAMIN LEE,
Secretary.

LEGAL OPINIONS.

LIABILITY IN DRILLING WELLS.

COLLINS
vs.
THE CHARTIERS VALLEY GAS COMPANY.

WILLIAMS, *Justice:*

A statement of the facts of this case is necessary to a correct understanding of the question presented by it. The appellant company is engaged in the production and sale of natural gas. In the prosecution of this business it secured a lease for gas purposes of the Mueller farm and drilled one or more wells upon it. The stratum in which gas is looked for in that region is about two thousand feet below the surface of the upland and three to four hundred feet runs in the narrow valley of Killbuck run. The borough of Glenfield is situated in this valley, and the well complained of was within the borough limits, and within a short distance of the dwellings of several inhabitants. The evidence shows that the geological formation in that neighborhood is sufficiently uniform so that veins of fresh water are encountered at about the same relative depth from the surface and veins of salt water at a tolerable uniform distance befow the fresh water. These veins of water are ordinarily found in the stratum of gravel or loose rock lying on a stratum of slate or other hard substance impervious to water which forms a bed or floor over which the water spreads in its stratum of gravel or rock until it finds its way to the surface. In places where a crevice or channel exists in the rock the water naturally gathers into it and thus an occasional subterranean stratum may be formed, but ordinarily the water is found deposited through the loose material overlying the floor of the water vein or stratum, and where this is penetrated by the drill the water

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gathers into the opening thus made. To facilitate the work of drilling it is desirable to prevent the water from flowing into the well. This is done as soon as the fresh water veins have been passed by the drill by inserting an iron casing extending from the surface to a point a few feet below the lowest vein. This allows the water to move in its bed just as freely as before the well was drilled without the least interference with its volume, direction or quality. When the fresh water is thus shut off the work of drilling is continued until the salt water veins are passed, when a similar method is resorted to for shutting that out of the well. After this is done the oil or gas bearing rock is penetrated and the well completed. If the well is successful the product can be secured at once undisturbed by either the salt water or the fresh or both as both are effectually cased out. If this process is properly conducted the veins of water both salt and fresh are left to move, percolating the flow as before, neither interferring with the well or with each other. The defendant began the work of drilling the well complained of with full knowledge of the general geological formation and with ample practical experience in the management of the water veins, but while the company shut the water out of its own well it did not separate the salt from the fresh but left it to mingle with the fresh and to flow through the fresh water veins into the wells of the neighborhood and destroy them. Mr. Hummell, the contractor, testified that the salt water could be kept from the fresh at an expense of about two hundred and fifty dollars per well and by the use of a device called a packer at a much less cost. He also said, what is very evident must be so, that when the salt water is allowed to mingle with the other it will "spoil the whole neighborhood." The wells of these plaintiffs were so near the gas wells that their danger was evident. Hummell was asked "you knew if you allowed the salt water to mingle with the other that it would destroy these wells?" and he answered "certainly I knew that. I have had that occur often." When asked why he did not shut the salt water off from the fresh he replied "well, because I was not instructed to do so, my contract did not read that way." Now upon the facts of this case it is evident that our question does not relate to the right of the owner of land to use it or to develope its resources in a lawful and proper manner. Such right may as a general proposition be conceded. If the owner or lessee of the Mueller farm had dug a well upon it and the water percolating the well had collected in it, leaving some neighboring well or wells dry, the owner being in the exercise of a legal right in the usual or proper manner, would not be liable to his neighbor for the loss of his well. If the farm was underlaid with coal or other mineral and as a consequence of mining in the usual and proper manner, the movement of the water in the soil or gravel should be raised so that it should find its way into the mine to the injury of the owners of wells and springs in the neighborhood, no action will lie against the owner of the mine. Wheatley *vs.*

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Baugh, 25 Pa. St. 528, Haldeman, *et al vs.* Bruckhart, 45 Pa. St. 514. And if in the raising the mine water to the surface for the purpose of drainage a surface stream is corrupted and rendered unfit for use, those affected thereby cannot recover damages. Sanderson *vs.* The Coal Company, 113 Pa. St. 136.

The question in this case relates not to the right but to the manner of its exercise. The defendant had a right to drill in search of natural gas, but it was bound to exercise this right in a reasonable manner and with due regard to the rights of others. In its search for gas it had to drill through nearly two thousand feet of the earth's courses with its successive layers or strata of rock, gravel, slate and other substances and through veins of water fresh and salt. In the ordinary course of drilling it has to be cased out of the well and the jury have found abundant evidence that at a small additional expense by a process well known and easily applied and in more or less frequent use throughout the oil and gas districts of Pennsylvania, they might have kept it from mingling, and the wells in the neighborhood saved thereby. If as then the maxium *sic utere tuo ut alienum non laedis* applies and the defendant is liable, not because it has unnecessarily injured the plaintiff in the exercise of its own legal right, but because it has injured them unnecessarily by the neglect of such reasonable precautions as might and should have been taken to protect them. According to the testimony this gas well was drilled with knowledge of the fact that salt water was to be encountered, that it should be confined to its own body, and if it was not, the whole neighborhood would be spoiled and that there were many wells nearby in the borough of Glenfield to be affected by their care or want of it in this particular. Yet no effort whatever was made to shut off the salt water or to avoid the destruction of the wells, which it was practicable to save. The ground of the defendant's liability is negligence, the want of reasonable care under the circumstances, for the rights of others.

This was plainly ruled when the case was here one year ago. Collins *vs.* The Chartiers Valley Gas Company, 131 Pa. St., 133. We then said if the injury was plainly to be anticipated and was easily prevented by the exercise of reasonable care at a reasonable cost, the plaintiff was within the exception recognized in all the cases from Wheatly *vs.* Baugh, down to the present time and was entitled to recover. The court below was right in the application of this doctrine and the judgment must be affirmed.

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REMOVAL OF DAM.

PHILADELPHIA, *March 21, 1892.*

DR. BENJAMIN LEE, *Secretary State Board of Health, etc.:*

DEAR SIR: Yours of the 11th inst. received, inclosing communication from Dr. S. M. Free, asking, in effect, (1) if the State Board of Health could condemn a certain dam at Punxsutawney, as a nuisance, and then purchase it for the purpose of its removal, the borough furnishing the necessary funds, or (2) if, in case a price could not be agreed on, the State Board could declare the dam a nuisance, and remove it summarily.

The State Board of Health is a department of the State, and has no power to hold real estate. It might, of course, recommend to the State the purchase of property, but could not take title itself. Its annual expenditure, too, is limited, though that would not affect the question, if the borough is to furnish the funds. But I do not consider it competent for the Board to buy the dam. If however the borough is disposed to compensate the owners, there would seem nothing to prevent.

With regard to the second point, I think the Board clearly has power, *in the absence of an efficient local board of health*, to declare the dam a nuisance, and proceed to have it abated. My impression is, that the previous experience of the Board has made them familiar with the details of such a proceeding. My recommendation, then, would be, that the Board proceed to inspect and condemn the premises as a nuisance, and have it abated. If the borough authorities intervene, purchase the dam, and give assurance to the Board that the nuisance will be removed, well. It looks as if the borough could not make favorable terms, until the Board take decided action.

Dr. Free speaks of an unsuccessful attempt having been made by civil suit. The opinion of the court in that case might modify my views, but this is my present impression of the matter. I decidedly think counsel on the ground ought to be consulted in this matter, before proceeding to extremes.

You will, of course, let me know if I can be of further use.

Very respectfully yours,

ALFRED LEE.

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PUBLIC AND PRIVATE NUISANCES.

PHILADELPHIA, *December 11, 1891.*

Dr. BENJAMIN LEE, *Secretary State Board of Health:*

DEAR SIR: I am in receipt of yours of the 9th inst., stating a case of a private suit brought for what appeared on the trial to be a public nuisance, and putting the question "Does the fact that a nuisance affects a number of citizens debar any one of them from suing for damages for the injury done him individually?" I would say no, if he can show a damage peculiar to himself, and different in kind and degree from and beyond that which is sustained by the general public. A nuisance may be both public and private, and a private person if specially aggrieved by a public nuisance may abate it; but he must make out a clear case of special damages to himself, of a different character from the rest of the public, "so that they cannot fairly be said to be a part of the common injury resulting therefrom." This is the old English law and it is supported by quite recent decisions in Pennsylvania. The reasoning is that any other view would be against the policy of the law as encouraging litigation. In the case you mention the decision would seem to be correct, and, the evidence showing a public nuisance, the defendant would be open to indictment, though the private action were non suited.

Very respectfully yours,

ALFRED LEE.

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APPENDIX K.

CONSTITUTION, BY-LAWS AND REGULATIONS OF THE STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH OF PENNSYLVANIA.

Constitution.

The Constitution of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania is the act of legislature establishing the board, approved June 3, 1885, of which the following is the correct text.

AN ACT

To establish a State Board of Health for the better protection of life and health, and to prevent the spread of contagious and infectious diseases in this commonwealth.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same,* That the Governor by and with the advice and consent of the Senate, shall appoint six persons, a majority of whom shall be physicians of good standing, graduates of regularly chartered and legally constituted medical colleges, and of not less than ten years' experience in the practice of their profession, and one of whom shall be a civil engineer, who, together with the secretary, the mode of whose appointment is hereinafter provided for, shall constitute and be designated as the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania. Of the six persons first appointed two shall serve for two years, two for four years, and two for six years, from the first day of July next following their confirmation; and the Governor shall thereafter biennally appoint, by and with the advice and consent of the Senate, two persons of the same professions as those whose terms of office have just expired, to be members of said board, to hold their offices for six years from the first day of July next following their confirmation, and until their successors are appointed, ex-

Manner of appointment.

Number of members

Term of service.

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cepting the secretary, who shall continue in office as hereinafter provided; but any member may be re-appointed. Any vacancy occuring in said board during a recess of the legislature shall be filled by the Governor until the next regular session of the same.

Manner of organization.

SECTION 2. As soon as possible after the appointment of the first six persons as aforesaid, they shall meet in the office of the Secretary of the Commonwealth, and shall proceed, under the direction of the latter officer, to determine, by lot, which of them shall serve for the respective terms of two, four and six years. Before entering upon the duties of the office, they shall take the oath prescribed for state officers by the constitution of the state, and shall file the same in the office of the Secretary of the Commonwealth, who, upon receiving the said oath of office, shall issue to each a certificate of appointment for his respective term of office determined as aforesaid; upon receiving which they shall possess and exercise the powers, and perform the duties, of said board as defined in this act. Immediately after having taken the oath of office, they shall organize by electing one of their number to be president, and by appointing a proper person, who shall be a physician of good standing, of not less than ten years' professional experience, and a graduate of a legally constituted medical college, to be secretary of said board, who shall hold his appointment until removed by the appointment of his successor or otherwise. The board may elect one of its own members secretary, in which case the vacancy thus created shall be filled by the Governor in the same manner as a vacancy caused in any other way. The president shall be elected annually. No member of the board except the secretary shall, as such, receive any salary; but the actual travelling and other expenses of any member while engaged on the actual duties of the board, shall be allowed and paid on presentation to, and approval by the Auditor General of an itemized account with vouchers annexed.

Appointment of secretary

Actual expenses of members to be paid.

Duties of secretary.

SECTION 3. The secretary shall be the executive officer of the board, and shall have all the powers and privileges of a member of said board, except in regard to voting upon matters relating to his own office and duties as secretary. He shall receive an annual salary of two thousand dollars, which shall be paid him in the same manner that salaries of other state offices are paid; and such necessary expenses as the Auditor General shall audit, on

Salary of secretary.

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presentation of an itemized account with vouchers annexed and the certificate of the board, shall be allowed him.

Time and place of meetings.

SECTION 4. The said board shall meet at least once every six months, and may also hold special meetings as frequently as the proper and efficient discharge of its duties shall require, in the capitol building at Harrisburg (unless otherwise ordered), and the rules and by-laws of the board shall provide for the giving of proper and timely notice of all such meetings to every member of the board. The Secretary of Internal Affairs shall provide and furnish such apartments and stationery as said board may require in the discharge of its duties. A majority of the members of the board shall, at any regular, called or adjourned meeting, organize and constitute a quorum for the transaction of business.

Duties and function of board defined.

SECTION 5. The State Board of Health and Vital Statistics shall have the general supervision of the interests of the health and lives of the citizens of the commonwealth, and shall especially study its vital statistics. It shall make sanitary investigations and inquiries respecting the causes of disease, and especially of epidemic diseases, including those of domestic animals, the sources of mortality, and the effects of localities, employments, conditions, habits, food, beverages and medicine on the health of the people. It shall also disseminate information upon these and similar subjects among the people. It shall, when required by the Governor or the legislature, and at such other times as it deems it important, institute sanitary inspections of public institutions or places throughout the state. It shall codify and suggest amendments to the sanitary laws of the commonwealth, and shall have power to enforce such regulations as will tend to limit the progress of epidemic diseases.

Powers of board.

SECTION 6. In cities, boroughs, districts and places having no local board of health, or in case the sanitary laws or regulations in places where boards of health or health officers exist should be inoperative, the State Board of Health shall have power and authority to order nuisances, or the cause of any special disease or mortality, to be abated and removed, and to enforce quarantine regulations as said board shall direct.

Penalty for violation and neglect.

Any person who shall fail to obey, or shall violate, such order shall, on conviction, be sentenced to pay a fine of not more than one hundred dollars at the discretion of the court.

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SECTION 7. It shall be the duty of the State Board of Health and Vital Statistics to have general supervision of the state system of registration of births, marriages and deaths, of prevalent diseases, and of practitioners of medicine and surgery, to prepare the necessary methods, forms and blanks for obtaining and preserving such records and to insure the faithful registration of the same in the several counties and in the Central Bureau of Vital Statistics at the capitol of the state. The said board shall recommend such forms and amendments of laws as shall be deemed to be necessary for the thorough organization and efficiency of the registration of vital statistics throughout the state. The secretary of the State Board of Health and Vital Statistics shall be the superintendent of registration of vital statistics as supervised by said board; the clerical duties and safe-keeping of the bureau of vital statistics thus created shall be provided for by the Secretary of Internal Affairs, who shall also provide and furnish such apartments and stationery as said board shall require in the discharge of such duties.

Functions of board in registration.

Secretary of Internal Affairs to provide stationery and apartments.

SECTION 8. It shall be the duty of all health officers and boards of health in the state to communicate to said State Board of Health copies of all their reports and publications, and also such sanitary information as may be requested by said board. And said board is authorized to require reports and information (at such times, and of such facts, and, generally, of such nature and extent as its by-laws or rules may provide) from all public dispensaries, hospitals, asylums, infirmaries, prisons and schools, and from the managers, principals and officers thereof, and from all other public institutions, their officers and managers, and from the proprietors, managers, lessees and occupants of all places of public resort in the state; but such reports shall only be required concerning matters or particulars in respect of which it may, in its opinion, need information for the proper discharge of its duties.

Local boards of health and institutions to report to board.

SECTION 9. Said board may, from time to time, engage suitable persons to render sanitary service or to make or supervise practical and scientific investigations and examinations requiring expert skill, and to prepare plans and reports relative thereto. But no more than two thousand dollars shall be expended in any one year for such special sanitary service.

Scientific investigations

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Annual report.

SECTION 10. It shall be the duty of said board, on or before the first Monday of December in each year, to make a report in writing to the Governor of this state upon the sanitary condition and prospects of the state, and such report shall set forth the action of the said board and its officers and agents, and the names thereof, for the past year, and may contain other useful information pertinent to the objects for which it was created, and shall suggest any further legislative action or precaution deemed proper for the better protection of life and health; and the annual report of said board shall also contain a detailed statement of the (State) Treasurer of all moneys paid out by or on account of said board, and a detailed statement of the manner of its expenditures during the year last past, but its total expenditures shall not exceed the sum of five thousand dollars in any one year.

So in P. L., probably a mistake of transcriber

Appropriation.

SECTION 11. The sum of ten thousand dollars ($10,000) is hereby appropriated from the treasury for the purposes of this act and the expenditures properly incurred by the authority of said board and verified by affidavit, subject, however, to the limitations hereinbefore imposed, and shall be paid by the Treasurer upon the warrant of the Auditor General.

SECTION 12. This act shall take effect immediately, and all acts or parts of acts inconsistent herewith shall be, and are hereby, repealed.

APPROVED—June 3, 1885.

ROBT. E. PATTISON.

AN ACT.

To regulate the publication, binding and distribution of the public documents of this commonwealth.

SECTION 1. *Be it enacted, etc.*, That from and after the passage of this act the printing, binding, distribution and number of the several public documents of this commonwealth shall be as follows, to wit:

XIX. Five thousand copies of the annual report of the State Board of Health and Vital Statistics be printed annually, four thousand to be bound in muslin and one thousand in paper; seventeen hundred and fifty thereof for the use of the House of Representatives, one thousand for the use of the Senate, seventy-five thereof for the use of the Governor, seventy-five thereof for the State Librarian for distribution and exchange with the states and territories, five hundred thereof for reserve work, and the

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remainder thereof for exchange and distribution by the State Board of Health.

APPROVED—The 16th day of April, A. D. 1887.

JAMES A. BEAVER.

By-Laws.

The By-Laws of the STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH of PENNSYLVANIA are as follows:

ARTICLE I.

Officers of the Board.

SECTION 1. The officers of the board shall be a president and secretary as directed by section two of the act establishing the board.

SECTION 2. All elections shall be by ballot.

ARTICLE II.

Duties of Officers.

SECTION 1. The president shall preside at the meetings of the board, preserve order, and perform such other duties as custom and parliamentary usage require. He shall be, *ex-officio*, a member of all committees.

SECTION 2. The secretary shall keep the records, and conduct the correspondence of the board. He shall be custodian of all books, documents, furniture and other property belonging to the board. He shall give proper and timely notice, in writing, of every regular and called meeting, to each member of the board, and shall, as executive officer, perform such other duties as are assigned by the act establishing the board, or by these by-laws, as the board may from time to time direct. All communications from the secretary to the board shall be in writing.

ARTICLE III.

Meetings.

SECTION 1. The regular meetings of the board shall be held on the second Thursday in May, July and November, at Harrisburg (unless otherwise ordered). At the meeting in July the election of officers shall be held. At the meeting in November the annual report shall be adopted, and at the meeting in May a public address on some sanitary topic shall be delivered.

SECTION 2. Special meetings shall be called by the president, at such time and place as he shall designate, whenever requested in writing by three members of the board, one of whom shall be the secretary.

SECTION 3. A majority of the members of the board shall at any regu-

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lar, called or adjourned meeting, organize and constitute a quorum for the transaction of business.

ARTICLE IV.

Order of Business.

SECTION 1. All meetings of the board shall be called to order at the appointed hour by the president. In the event of his absence a chairman *pro tempore* shall be appointed.

SECTION 2. At regular meetings the business shall be conducted as follows:

1. The secretary shall register the names of the members present.
2. The minutes of the last regular meeting shall be read.
3. The minutes of special meetings held since the last regular meeting shall be read.
4. Report of the secretary.
5. Reports of standing committees.
6. Reports of special committees.
7. At the meeting in July, nomination and election of a president for the ensuing year; at the meeting in November, appointment of standing committees.
8. Unfinished business.
9. New business.
10. Adjournment.

SECTION 3. At special meetings the following shall be the order of business.

1. Registration of names of members present.
2. Reading of minutes if called for.
3. Presentation of special subject.
4. Presentation of accounts.
5. Adjournment.

ARTICLE V.

Report of the Secretary.

The secretary shall at the meeting in November, make a full report of his official acts during the year ending October 1 preceding, and accompany the same with recommendation of such measures as he shall deem necessary for the preservation of the public health and the faithful execution of the law, and this report shall constitute the basis of the report of the board to be presented to the Governor on or before the first Monday of December in each year, in accordance with the requirements of section ten of the act constituting this board.

ARTICLE VI.

Standing Committees.

SECTION 1. The following standing committees shall be appointed by the president of the board at the meeting in November:

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1. An executive committee.

2. A committee on registration and vital statistics.

3. A committee on preventable diseases, disinfection and supervision of travel and traffic.

4. A committee on water supply, drainage, sewerage, topography and mines.

5. A committee on public institutions and school hygiene.

6. A committee on adulterations, poisons, explosives and other special sources of danger to life and limb.

7. A committee on sanitary legislation, rules and regulations.

SECTION 2. Such papers, communications or other matter received by the secretary, as he may deem proper for the purpose, he shall forward to the chairman of the appropriate committee, after filing the titles and memoranda, which shall be recorded in the secretary's office.

SECTION 3. All reports of committees shall be in writing.

ARTICLE VII.

Finances.

SECTION 1. All accounts against the board shall be filed with the secretary, and may be presented at any meeting of the board, when they shall be acted on in open session; and all accounts allowed shall be endorsed "Approved by order of the State Board of Health and Vital Statistics," and shall be endorsed by the president and secretary.

SECTION 2. The secretary shall record in a book reserved for that purpose, all accounts of expenditures ordered or made by the board and its several members, and shall, before presenting any bill, account or voucher to the Auditor General, cause a copy of the same to be recorded, and shall have stamped upon such voucher, account or bill the audit and date, as the executive committee shall provide.

ARTICLE VIII.

Executive Committee.

SECTION 1. The executive committee shall consist of not less than three members, including the secretary of the board, who shall be secretary of the committee.

SECTION 2. It shall have the general supervision of the finances, purchases, expenses and publications of the board.

SECTION 3. Its office shall be in the city of Philadelphia until otherwise ordered.

SECTION 4. It shall hold meetings at least quarterly, and as much oftener as it shall deem necessary, and shall meet on the call of the chairman.

SECTION 5. With the approval of the board or of the executive committee, the secretary shall make requisition upon the Secretary of Inter-

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nal Affairs for such stationery, printed forms, clerical labor, apartments and furniture as shall be needed for the use of the board.

SECTION 6. No purchases shall be made or expenditure incurred except by order of the board or of the executive committee; and the executive committee shall not have power to incur any indebtedness beyond the amount appropriated by law.

ARTICLE IX.

Rules of Order.

In conducting the business of the meetings of the board, the parliamentary rules governing the legislature of the State of Pennsylvania shall be adopted so far as they are applicable to its deliberations.

ARTICLE X.

Seal.

The seal of the board shall be circular in shape, bearing on the circumference the words, "State Board of Health. Pennsylvania. 1885. *Salus Populi Suprema Lex.*" and in the center the coat-of-arms of the commonwealth.

ARTICLE XI.

Amendments.

These by-laws may be altered or amended at any regular meeting of the board by a two-thirds vote of the members present.

REGULATIONS OF THE BOARD.

(R. I.)

REGULATIONS IN REGARD TO THE ABATEMENT AND REMOVAL OF NUISANCES.

Whenever a complaint is made in writing to the secretary of the board of the existence of a nuisance, he shall forthwith, as executive officer of the board, investigate the matter, and shall determine whether the alleged nuisance is detrimental to the public health, or the cause of any special disease or mortality; and in case he shall so find, then he shall notify the owner, agent or occupier of said premises, in writing, of such finding, and the executive office shall thereupon order and direct the abatement and removal of the same within — – days; and in the event of the failure of said owner, agent or occupier of said property to abate and remove the nuisance, then the executive officer may proceed to abate

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and remove the same, and may employ all the force necessary to do so, and shall proceed by warrant, arrest and indictment to convict the party failing to obey said order of abatement and removal.

(R. II.)

PROVISIONAL REGULATIONS FOR PREVENTING HOUSE, YARDS, STREETS, SLAUGHTER HOUSES, STOCK YARDS, HOG PENS, BONE-BOILING AND FAT-RENDERING AND OTHER SIMILAR ESTABLISHMENTS FROM BEING OR BECOMING PREJUDICIAL TO THE PUBLIC HEALTH.

Nuisances Defined.

1. Whatever is dangerous to human life or health, and whatever renders soil, air, water or food impure or unwholesome, are declared to be nuisances and to be illegal, and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them, shall be deemed guilty of a violation of these regulations.

House Refuse, Garbage, Etc.

2. No house refuse, offal, garbage, dead animals, decaying vegetable matter, or organic waste-substance of any kind, shall be thrown upon any street, road, ditch, gutter or public place, and no putrid or decaying animal or vegetable matter shall be kept in any yard, house, cellar or adjoining out-buildings for more than twenty-four hours.

Noxious Trades.

3. No person or company shall erect or maintain any manufactory or place of business dangerous to life or detrimental to health, or where unwholesome, offensive, or deleterious odors, gas, smoke, deposit or exhalations are generated, within one mile of the limits of any city or borough, without the permit of the board of health or borough council of said city or borough, and all such establishments shall be kept clean and wholesome so as not to be offensive or prejudicial to public health, nor shall any offensive or deleterious waste-substance, refuse or injurious matter be allowed to accumulate upon the premises or be thrown or allowed to run into any public waters, stream, water-course, street, road or public place. And every person or company conducting such manufacture or business shall use the best approved and all reasonable means to prevent the escape of smoke, gases and odors, and to protect the health and safety of all operatives employed therein.

4. The business of bone and horse boiling shall not be allowed, unless conducted under cover, the building to be provided with smoke consumers, and a due regard be had to cleanliness in the disposition of the offal. No bone-boiling establishment or depository of dead animals shall be kept or erected in any part of this commonwealth which is not under

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the jurisdiction of a local board of health, without a permit from the board of health or borough council of the nearest city or borough.

5. No permit shall be granted to any person or persons to carry on the business of boiling bones and dead animals until after a careful inspection of the locality, buildings and apparatus, and of the plans for conducting the business, by an accredited inspector of the State Board of Health, or, if such inspector be not accessible, then by an inspector appointed for the purpose by the board of health or borough council of the nearest city or borough.

6. No bone-boiling establishments or depositories of dead animals shall be kept or erected in or near to a thickly inhabited neighborhood.

7. The floors of all bone-boiling establishments and depositories of dead animals shall be paved with asphalt or with brick or stone, well laid in cement, or with some other impervious material, and shall be well drained. All such establishments shall have such an adequate water supply as will enable thorough cleanliness to be maintained.

8. The boiling of bones and dead animals, etc., shall be conducted in steam-tight kettles, boilers or caldrons, from which the foul vapors shall first be conducted through scrubbers or condensers, and then into the back part of the ash-pit of the furnace fire, to be consumed, or by other apparatus equally efficient in preventing or counteracting the offensive effluvia.

9. When bones are being dried after boiling, they shall be placed in a close chamber, through which shall be passed, by means of pipes, large volumes of fresh air, the outlet pipe terminating in the fire-pit.

10. All proprietors of bone-boiling establishments not having, on the first day of July, 1886, permits to carry on the business, and violating these regulations, shall be liable to prosecution for failing to obey this order and also to an indictment at common law for creating and maintaining a nuisance.

11. The permit clerk of each local board of health or borough council shall have provided a book in which to enter the names of all persons engaged in the business of boiling bones and having depositories of dead animals; also, the location of works and appliances as reported by the inspector, whether licensed or not, the number and date of permit, and remarks.

12. No person or persons, without the consent of the board of health or borough council of the nearest city or borough, shall build or use any slaughter house within the limits of this commonwealth; and the keeping and slaughtering of all cattle, sheep and swine, and the preparation and keeping of all meats, fish, birds or other animal food, shall be in the manner best adapted to secure and continue their wholesomeness as food; and every butcher or other person owning, leasing or occupying any place, room or building wherein any cattle, sheep or swine have been or are killed or dressed, and every person being the

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owner, lessee or occupant of any room or stable wherein any animals are kept, or of any market, public or private, shall cause such place, room or building, stable or market, to be thoroughly cleansed and purified, and all offal, blood, fat, garbage, refuse and unwholesome and offensive matter to be removed therefrom at least once in every twenty-four hours after the use thereof for any of the purposes herein referred to, and shall also at all times keep all woodwork, save floors and counters, in any building, place or premises aforesaid, thoroughly painted or whitewashed; and the floors of such building, place or premises shall be so constructed as to prevent blood or foul liquids or washings from settling in the earth beneath.

13. No blood-pit, dung-pit, offal-pit or privy-well shall remain or be constructed within any slaughter house. Any one offending against this rule shall be guilty of creating and maintaining a nuisance prejudicial to the public health, and shall be required to remove the nuisance within ten days from the date of notice.

14. The owners, agents, or occupiers of all slaughter houses are required, during the months of June, July, August and September, to distribute twice in each week not less than twenty-five pounds of chloride of lime about the premises, and also to remove the contents of any manure-pit or manure-pile on the premises, once in each week, the said premises and contents of manure-pits being hereby declared to be nuisances prejudicial to the public health, unless subject to frequent disinfection and cleaning as herein indicated.

15. *All constables and supervisors are enjoined, and all citizens are respectfully desired*, to give information to the State Board of Health of any violation of the health laws, or of the regulations of the board, so that the sanitary measures adopted by the latter to ensure the health of the people may be fully carried out, and all offenders promptly punished.

NOTE.—Section six of the act of June 3, 1885, confers upon the State Board of Health power and authority to *order nuisances to be abated and removed in cities, boroughs, districts and places* having no local board of health. Any person violating or failing to obey such order becomes liable, on conviction, *to a fine of one hundred dollars.*

(R. III.)

REGULATIONS IN REGARD TO THE SANITARY SUPERVISION OF TRAVEL AND TRAFFIC.

Upon satisfactory information of the approach to, or the transit through, the Commonwealth of Pennsylvania, of infected persons or goods, it shall be the duty of the secretary, as executive officer of the board, to cause the same to be stopped at the state line, or, if found within the limits of the state, to cause such persons or goods to be removed from cars, stages, vessels, boats or other conveyances, and securely isolated and disinfected; and he may, if, in his judgment, the emergency is such

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as to demand it, call a meeting of the "Committee on Travel and Traffic," to which his action shall be submitted, with his reasons therefor, in writing. But, in cases coming under the jurisdiction of national or municipal quarantine authorities, he shall co-operate with said authorities in all such action.

(R. IV.)

REGULATION OF TRAVEL AND TRAFFIC.

REGULATIONS IN REGARD TO DISINTERMENT AND TRANSPORTATION OF DEAD BODIES.

Disinterment of Bodies.

Rule I. The removal of any body from its place of original interment is declared to be a nuisance dangerous to the public health, and is prohibited, unless the same be done under the direction and by permission of the local board of health or borough council.

Rule II. The above rule applies as well to the removal of a body from one grave or vault to another in the same cemetery as to its removal to another burial ground or place.

Rule III. The removal of dead bodies from any burial ground situated within the built-up portion of any city or borough is forbidden between April 1 and October 15.

Rule IV. The disinterment of the body of any person who died of any contagious or infectious disease is strictly prohibited, unless by special authority, and upon such conditions as the local board of health or borough council may impose.

Transportation of Bodies.

Rule I. The transportation of bodies of persons who shall have died from small-pox, Asiatic cholera, typhus fever, diphtheria or yellow fever is strictly forbidden.

Rule II. From October 15 to April 1, all other dead bodies may be transported without restriction, except those who shall have died of scarlet fever, typhoid fever or measles, which must be enclosed, as prescribed in Rule III.

Rule III. From April 1 to October 15, all dead bodies, when presented for transportation, must be enclosed in air-tight zinc, copper or lead-lined wooden boxes, or in air-tight iron caskets; or if in any other form of coffin, said coffin must be in a hermetically sealed box, enclosed in a manner satisfactory to the local board of health, health officer or borough council.

Bule IV. No person or article which has been exposed to the contagion can accompany the body.

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Rule V. Every dead body must be accompanied by a physician's certificate of death, and a certificate from the shipping undertaker that the body has been prepared for transportation in accordance with the rules of the State Board of Health of the Commonwealth of Pennsylvania.

Rule VI. In receiving any dead body which has been shipped from beyond or within the States of New York, New Jersey, Delaware, Maryland, West Virginia or Ohio, or the Province of Ontario, the rules of the state or provincial boards of health of the same must be respected, and their transit permits will be honored without subjecting the body to delay, provided such rules do not conflict with any of the preceding rules in these regulations.

Rule VII. The following shall be the form of a transit permit for the transportation of a dead body within, into, or out of, the limits of the Commonwealth of Pennsylvania:

NOTE.—The rules and regulations of the State Board of Health are laws to be obeyed by every individual in the state.

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TRANSIT.

[Stub to be retained by official issuing Permit.]

TRANSIT PERMIT.

1. *Issued to* .....
2. *Name of Deceased*, ...
(If a minor, give parents' names.)
.....
3. *Interment at* .....
4. *Date of Death*, ...*Age*, ...
5. *Place of Death*, ...
6. *Cause of Death*, ...
7. *Certified by* .....
.....*M. D.*

(The size of this permit without the stub is 10x4 inches.)

FORM 7.

Commonwealth of Pennsylvania.

[To be issued by any State or Local Health Official.]

TRANSIT PERMIT. [For Public Carriers.]

R. R. Agents and all other Carriers see Back of Permit.

Office of .....*County.*

.....*189*

Permission is hereby given to remove the remains of .....

aged....., *who died at* .....

(City, borough, or township and county.)

on the....*day of*.....*189 ; the cause of death being* .....

and a Transit Permit being asked for burial at .....

in the State of .....

(*Signed by*) .....

Name of Undertaker or person in charge of the Transit. } .....(Official title.)

.....(P. O. address.)

☞ This Permit must in all cases accompany the body to its Destination.

Coupon No. 3, to Transit Permit of .....(Name.)

.....*who died at* .....

Before this body leaves.....the Carrier or Transportation Agent will tear off this Coupon. If otherwise detached from the permit the Coupon must not be received. (*See back of Permit.*)

Coupon No. 1, to Transit Permit of .....(Name.)

.....*who died at* .....

Before this body leaves.....the Carrier or Transportation Agent will tear off and keep this Coupon. If otherwise detached from the permit the Coupon must not be received. (*See back of Permit.*)

TRANSIT PERMIT.

Issued at ....*Co., Pa.*

Issued by .....

To whom issued, ...

Name of Deceased, ...

Date of Death, ...

Name of person or Carrier in charge, ...

Date of Transit, ...

BACK OF ABOVE PERMIT.)

☞ Railroad and Steamboat Agents, Ferry-Masters and all Carriers that convey the remains over the limits of the county where the death occurred will retain one of the Coupons hereto attached, and deliver the body only to the persons holding this permit. The name of the deceased must appear on the Coupons, which will be returnable to the city or place through or out of which the body is first conveyed, or to such authority as may be directed by the person who issued the Permit.

The 1st *Coupon should be taken by the carrier who transports the body from the county where the death occurred ; and the* 2d *should be taken by Carrier or Agent of Transportation upon the route beyond said county, and it may be so taken at either terminus of the distance over which the second stage of transportation extends, as the local sanitary regulations may require ; but whoever detaches and takes said* 2d *Coupon must write across the back of the Permit, as well as upon the* 2d *Coupon itself in the space at the left of these directions, as follows:*

2d Coupon taken at ..... *by* .....

Such an indorsement will answer instead of further coupons wherever the body is conveyed ; and the Permit is to be surrendered at the place of burial. It, as well as every Coupon, should be preserved.

2d Coupon taken at.....

by.... ....

SECOND COUPON. } *taken at*.....
by.....

FIRST COUPON.

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(R. V.)

REGULATION IN REGARD TO THE INTERSTATE NOTIFICATION OF THE EXISTENCE OF INFECTIOUS AND CONTAGIOUS DISEASES.

The following are the resolutions adopted by the International Conference of Boards of Health, at Toronto, October 6, 1886, with slight verbal modifications:

WHEREAS, It is necessary for the protection and preservation of the public health that prompt information should be given of the existence of cholera, yellow fever or small-pox; be it *Resolved*—

1. That it is the sense of the National Conference of State Boards of Health, that it is the duty of each State and provincial board of health within whose jurisdiction any of said diseases may occur to furnish immediate information of the existence of such disease to boards of health of neighboring states and provinces, and to local boards in such states as have no central board, in which the duty of notification shall lie upon the local boards.

2. That upon the prevalence of rumor of the existence of pestilential disease in any State or province, if positive definite information thereon be not obtainable from the proper health authorities, this conference holds that the health officials of another State are justified in entering the before-mentioned State or province for the purpose of investigating and establishing the truth or falsity of such reports.

3. That whenever practicable, the investigations undertaken under the preceding section shall be made with the co-operation of the State or local health authorities.

4. That any case which presents symptoms leading to serious suspicion of the existence of one of the aforenamed diseases shall be treated as suspicious, and reported as provided for in cases in which the diagnosis is certain.

5. That any case respecting which reputable and experienced physicians disagree as to whether the disease is or is not pestilential, shall be reported as suspicious.

6. That any suspected case respecting which efforts are made to conceal its existence, full history and true nature, shall be deemed suspicious and so reported.

7. That in accordance with the provisions of the foregoing resolutions, the boards of health of the United States and Canada represented at this conference, do pledge themselves to an interchange of information as herein provided.

I certify that the foregoing resolutions were endorsed, and adopted as a regulation, by the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, at a regular meeting held November 10, 1886.

BENJAMIN LEE,
Secretary.

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Addendum to regulation in regard to the interstate notification of contagious and infectious diseases, adopted by the National Conference of State Boards of Health at Washington, September 8, 1887, and by the State Board of health of Pennsylvania, November 9, 1887.

1. All communicable diseases, hereinafter mentioned, prevalent in certain areas, or which tend to spread along certain lines of travel, shall be reported to all state and provincial boards of health within said areas or along said lines of communicatian.

2. In the instance of small-pox, cholera, yellow fever and typhus, reports shall be at once forwarded, either by mail or telegraph, as the urgency of the case may demand.

3. In the instance of diphtheria, scarlet fever, typhoid fever, anthrax or glanders, weekly reports when possible shall be supplied in which shall be indicated as far as known the places implicated and the degree of prevalence.

(R. VI.)

REGULATION OF THE STATE BOARD OF HEALTH AND VITAL STATISTICS OF THE COMMONWEALTH OF PENNSYLVANIA FOR THE BETTER PRESERVATION OF THE PUBLIC HEALTH, AND TO LIMIT THE PROGRESS OF EPIDEMIC (CONTAGIOUS AND INFECTIOUS) DISEASES.

In virtue of the powers conferred by the act of assembly of June 3, 1885, section five and six, P. L. 56 of the Laws of the Commonwealth of Pennsylvania, be it ordered by the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, and it is hereby ordered by the authority of the same:

Nuisances defined.

SECTION 1. That whatever is dangerous to human life or health, whatever renders the air or food or water or other drink unwholesome, and whatever building, erection or part of cellar thereof, is overcrowded, or not provided with adequate means of ingress and egress, or is not sufficiently supported, ventilated, sewered, drained, cleaned or lighted, are declared to be nuisances, and to be illegal; and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them, shall be deemed guilty of a violation of this regulation, and also be liable for the expense of the abatement and remedy therefor.

House refuse, garbage, etc., not to be exposed.

SECTION 2. No house-refuse, offal, garbage, dead animals, decaying vegetable matter, or organic waste substance of any kind, shall be thrown on any street, road, ditch, gutter or public place, and no putrid or decaying

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animal or vegetable matter shall be kept in any yard, house, cellar or adjoining out-building or grounds for more than twenty-four hours.

Pig pens to be properly constructed and kept clean.

SECTION 3. No pig pen shall be built or maintained within one hundred feet of any well or spring of water used for drinking purposes, or within thirty feet of any street or of any inhabited house, or unless constructed in the following manner, viz., so that the floor or floors of the same shall be not less than two feet from the ground, in order that the filth accumulating under the same may be easily removed.

Privies not to remain near wells of drinking water.

SECTION 4. No privy-vault, cesspool, or reservoir into which a privy, water-closet, cesspool, stable or sink is drained, unless it is water-tight, shall be constructed, dug or permitted to remain within one hundred and fifty feet of any well, spring or other source of water used for drinking or culinary purposes; unless the surface of such vault, cesspool or reservoir is at a lower level than the bottom of such well. Earth privies and earth closets, with no vault, pit or depression below the surface of the ground, shall be excepted from this regulation, but sufficient dry earth or coal ashes must be used daily to absorb all the fluid part of the deposit.

SECTION 5. All sewer drains shall be water-tight.

Sewer-drains not to contaminate water supply.

SECTION 6. No sewer-drain shall empty into any lake, pond, dam, reservoir, or other collection of water used for drinking purposes, or into any standing water.

SECTION 7. All pipes connecting a water-closet with a soil pipe shall be trapped, each separately. All waste pipes shall be trapped, each separately, and close to the connections with each bath, sink, bowl or other fixture, unless adequate provision is made for downward ventilation through said waste-pipes, in which case one trap may serve for several fixtures.

SECTION 8. All soil pipes shall be carried at their full size through the roof and left open. A provision shall also be made for admitting air to the house-drain side of the main trap, if such trap exists.

SECTION 9. The joints in vitrified pipes shall be carefully cemented under and around the pipe, and the joints in cast iron pipes shall be run and calked with lead.

SECTION 10. All changes in direction shall be made with curved pipes. All joints and pipes shall be made air tight.

SECTION 11. The following named diseases are declared

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Diseases dangerous to public health enumerated.

to be communicable and dangerous to the public health, viz: Small-pox (variola, varioloid), cholera (Asiatic or epidemic), scarlet fever (scarlatina, scarlet rash), measles, diphtheria (diphtheritic croup, diphtheritic sore throat), typhoid fever, typhus fever, yellow fever, spotted fever (cerebro-spinal meningitis), relapsing fever, epidemic dysentery, hydrophobia (rabies), glanders (farcy), and leprosy, and shall be understood to be included in the following regulations, unless certain of them only are specified.

Householders required to report.

SECTION 12. Whenever any householder knows that any person within his family or household has a communicable disease, dangerous to the public health, he shall immediately report the same to the school board (or borough council), giving the street and number, or location of the house.

Physicians required to report.

SECTION 13. Whenever any physician finds that any person whom he is called upon to visit has a communicable disease, dangerous to the public health, he or she shall immediately report the same to the school board (or borough council), giving the street and number or location of the house, on the receipt of which report the said board shall immediately notify the teacher or principal of every school in the district, instructing said teachers or principals to dispense with the attendance of all pupils residing in the family in which such disease exists. No physician who may, in good faith, in obedience to this regulation, report a case as one of communicable disease which subsequently proves not to be such, shall be liable to a suit for damages for such error in reporting. It shall be the duty of such physician and of all other attendants upon persons affected with such diseases to avoid exposure to the public of any garments or clothing about their own persons that may have been subjected to the risk of infection.

School teachers to be notified.

Physicians not to be sued for mistakes in obeying this regulation.

Exposure of infected persons or things forbidden.

SECTION 14. No person shall, unless by permit of a board of health (or borough council), carry or remove from one building to another any patient affected with any communicable disease, dangerous to the public health. Nor shall any person, by any exposure of any individual so affected, or of the body of such individual, or of any article capable of conveying contagion or infection, or by any negligent act connected with the care or custody thereof, or by a needless exposure of himself or herself,

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cause or contribute to the spread of disease from any such individual or dead body.

SECTION 15. There shall not be a public or church funeral of any person who has died of Asiatic cholera, small-pox, typhus fever, diphtheria, yellow fever, scarlet fever or measles, and the family of the deceased shall in all such cases limit the attendance to as few as possible, and take all precautions possible to prevent the exposure of other persons to contagion or infection; and the person authorizing the public notice of death of such person shall have the name of the disease which caused the death appear in such public notice.

Funerals after infectious diseases forbidden.

Public notice of cause of death required.

SECTION 16. No person suffering from, or having very recently recovered from, small-pox, scarlet fever, diphtheria, yellow fever or measles shall expose himself, nor shall any one expose a person under his charge in a similar condition, in any public conveyance, without having previously notified the owner or person in charge of such conveyance of the fact of such condition as above stated. And the owner or person in charge of such conveyance must not, after the entry of any person so infected into his conveyance, allow any other person to enter it without having sufficiently disinfected it.

Public conveyances not to be infected.

Infected conveyances not to be used until disinfected.

SECTION 17. No person shall let or hire any house or room in a house in which a commuicable disease, dangerous to the public health, has recently existed, until the room or house and premises therewith connected have been disinfected and for the purposes of this section, the keeper of a hotel, inn or other house for the reception of lodgers, shall be deemed to let or hire part of a house to any person admitted as a guest into such hotel, inn or house.

Infected houses or rooms not to be let

SECTION 18. Members of any household in which small-pox, diphtheria, scarlet fever or measles exist shall abstain from attending places of public amusement, worship or education, and, as far as possible, from visiting other private houses.

Isolation of families required.

SECTION 19. The clothing, bed-clothing and bedding of persons who have been sick with any communicable disease, dangerous to the public health, and the rooms which they have occupied during such sickness, together with their furniture, shall be disinfected as directed in the circulars of this board.

Disinfection required.

SECTION 20. No animal affected with a communicable disease, dangerous to the public health, shall be brought within the limits of this commonwealth, and the bodies of such animals dead of such disease or killed on account

Infected animals to be excluded.

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thereof shall be buried with quicklime under four feet of earth or burned, but shall not be buried within five hundred feet of any residence, or of any source of water supply.

Milk not to be adulterated.

SECTION 21. No milk which has been watered, adulterated, reduced or changed in any respect from its natural condition by the addition of any foreign substance, shall be held, kept or offered for sale.

No unwholesome food to be sold.

SECTION 22. No meat, fish, birds, fowls, fruit, vegetables, milk, and nothing for human food, not being then healthy, fresh, sound, wholesome, fit and safe for such use, nor, any animal or fish that died by disease, and no carcass of any calf, pig or lamb, which at the time of its death was less than three weeks old, and no meat therefrom shall be brought within the limits of this commonwealth or offered or held for sale as food.

Cellars to be cleansed.

SECTION 23. It shall be the duty of the occupant of every house in the month of May, in each and every year, to cleanse the cellars thereof of all dirt, vegetable and other impure matter calculated to engender disease, and to cause them to be thoroughly whitewashed with fresh lime.

Vaccination of school children required.

SECTION 24. No pupil shall be allowed to attend the public schools in this commonwealth who has not been vaccinated successfully within seven years.

Period of isolation established for school children.

SECTION 25. No parents, guardian or master, in whose house or family there shall have been a communicable disease, dangerous to the public health, shall permit any child residing in said house or family to attend any public, private or Sunday school, after the cessation of said disease, within a period of ten days after the house shall have been thoroughly disinfected and cleansed. And it shall be the duty of school boards to have this section printed on cards, mentioning the names of diseases declared communicable and dangerous to the public health in section thirty-one of this regulation, and posted in every school room, and it shall be the duty of each teacher to read the section to the school at least once a month and whenever any epidemic shall appear.

Children to be instructed in regard to danger of infection.

Sextons, cemetery keepers, etc.

SECTION 26. Every person who acts as a sexton or undertaker, or cemetery keeper, or has the charge of any tomb, vault, burying grounds or other place for the reception of the dead, or where the bodies of any human beings are deposited, shall so conduct his business and so care for any such place above named, as to avoid detri-

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ment or danger to public health; and every person undertaking preparations for the burial of a body dead from communicable diseases as hereinbefore enumerated, shall adopt the precautions prescribed in Regulation IV of this board. No dead body shall be exhumed and removed between the months of May and October inclusive, and nobody dead from any contagious or infectious disease shall be exhumed and removed unless by special authority and upon such conditions as the State Board of Health may impose.

Penalties to be inflicted.

SECTION 27. Every person violating any section of this regulation is liable for every such offense, upon conviction before any court, to a fine of not more than one hundred dollars, at the discretion of the court.

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APPENDIX L.

ADDITIONS TO LIBRARY.

LIST OF BOOKS RECEIVED FROM NOVEMBER 16, 1892, TO OCTOBER 26, 1892, BY GIFT OR EXCHANGE.

Fifth Annual Report of the State Board of Health of Ohio. Four copies.

Report on the Etiology and Prevention of Yellow Fever, by George M. Sternberg, lieutenant-colonel and surgeon United States army.

Report on the Sanitary State of the City of Montreal, Canada, 1890, by Louis Laberge, M. D., medical health officer.

Report of the Secretary of Agriculture for 1891. Hon. J. M. Rusk, secretary.

Fourteenth Annual Report of the Health Commissioner of city of St. Louis, Mo., 90–91. George I. Dudley, M. D., health commissioner,

Report of the Surgeon General of the Army to the Secretary of War, year ending June 30, 1891. Charles Sutherland, surgeon general.

Twenty-third Registration Report [Births, Marriages and Deaths] of Michigan. Dr. Henry B. Baker, Lansing. Eight copies.

Forty-ninth Registration Report of Massachusetts, 1890. Dr. Samuel W. Abbott.

Report of Ship Canal Commission of Pennsylvania to General Assembly, 1891. Thomas J. Stewart, Secretary of Internal Affairs.

Water Ways of Pennsylvania.

Sixth Biennial Report of the State Board of Health of Iowa, for period ending June 30, 1891. Dr. J. F. Kennedy, Des Moines, Iowa.

Report of the Potable Water Supply of the city of New York. Dr. Lewis Balch.

First Annual Report of the Secretary of the State Board of Health of Vermont.

Manual, Boards of Health in Massachusetts. Dr. Samuel W. Abbott, Boston, Mass.

Laws, Rules and Regulations relating to the Public Health of Indiana.

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Annual Report of the Supervising Surgeon General of the Marine Hospital Service of the United States. Dr. Walter Wyman.

Transactions of the New Hampshire Medical Society, held at Concord, June 15–17, 1881. Dr. Granville D. Conn, Concord, New Hampshire.

Annual Reports of the Supervising Surgeon General of the United States Marine Hospital Service, 1887, 1889 and 1890.

Reports of the Superintendent of Public Instruction of Pennsylvania for years 1890 and 1891. Rev. J. D. Waller, Jr.

Transactions of the International Homœopathic Congress and of the American Institute of Homœopathy. Dr. Pemberton Dudley, Philadelphia.

Ninth Biennial Report of the State Board of Health of Maryland, ending 31st of December, 1891. Dr. C. W. Chancellor.

Transactions of the Michigan State Medical Society. Dr. Charles W. Hitchcock.

Fifth Annual Report of the State Board of Health of Vermont. Four copies.

Transactions of the New York State Medical Association, 1891.

Fifteenth Annual Report of the State Board of Health of New Jersey, 1891. Dr. Ezra M. Hunt, Trenton, New Jersey.

Fifth Report of the Agricultural Experiment Station of Nebraska.

Physicians of Nebraska and Proceedings of the State Board of Health of Nebraska. Dr. F. D. Haldeman, Ord, Neb.

Twentieth Annual Report of the Board of Health of Boston, Mass.

Tenth Annual Report of the State Board of Health of New Hampshire. Dr. Irving A. Watson, Concord, N. H. Two copies.

Eleventh Annual Report of the State Board of Health of Illinois, 1888. Dr. F. W. Reilly, Springfield, Ill.

Weekly Abstracts of Sanitary Reports, Vol. VI, 1891. Dr. Walter Wyman.

Seventh Annual Report of the State Board of Health of Kansas. Dr. M. O'Brien, Topeka, Kansas.

Report on the Health of the City of Birmingham, England, 1891. Dr. Alfred Hill, medical officer of health.

Registration Report of Ontario, 1890. John Dryden, Registrar-General, Toronto, Ont.

Annual Report of the State Board of Health of Missouri, 1891. Dr. R. C. Atkinson, St. Louis, Mo. Ten copies.

Geographical Surveys of Pennsylvania. Four copies.

Tenth Annual Report of the Indiana State Board of Health, year ending October, 1891. Dr. C. N. Metcalf.

Fourteenth Annual Report of the State Board of Health of Connecticut. Dr. C. A. Lindsley, New Haven, Conn.

Third Annual Report of the State Board of Health of Florida. Dr. J. Y. Porter, Jacksonville, Fla.

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New Hampshire Registration Report, 1890. Dr. Irving A. Watson, Concord, N. H.

New Hampshire Commissioners of Lunacy Report, 1891. Dr. Irving A. Watson.

Report on Cholera in Europe and India, by Dr. E. O. Shakespeare, State Department, Washington, D. C. Seven copies.

Fourth Annual Report of the Department of Public Safety of Pittsburg, year 1891. Crosby Gray, chief clerk.

Seventh Annual Report of the State Board of Health of Maine, 1891. H. A. G. Young, Augusta, Me.

Twenty-second Report of the Pennsylvania State Board of Commissioners of Charities, 1891. Cadwalader Biddle, secretary.

Annual Report of the Bureau of Water of Philadelphia, 1891. John L. Ogden, chief of department.

LIST OF PAMPHLETS RECEIVED FROM NOVEMBER 16, 1891 TO OCTOBER 26, 1892, BY GIFT OR EXCHANGE.

Improved Method of Sewage Disposal, the Chancellor Patent Process and Apparatus. Dr. C. W. Chancellor, Baltimore, Maryland.

Report of the Philadelphia Maritime Exchange, 1891. Edward Sharwood, secretary.

Water supply and Sewerage. Dr. S. W. Abbott, Boston, Mass.

Public Health Laws of Illinois. Dr. F. W. Reilly, Springfield, Ill.

Report of Sixth Annual Meeting of the Association of Executive Health Officers of Ontario, at Trenton, 1891. Dr. C. McClellan.

Laws of the State of Kentucky Relating to the Public Health. Dr. J. N. McCormack, Bowling Green, Ky.

The Necessity for more Stringent Legislation to Repress Empiricism. By Albert H. Orton, Topeka, Kansas.

Disposal of Garbage and Waste, Report of Committee of A. P. A. H. Dr. Irving A. Watson, Concord, N. H.

Annual Report of Health Department of the City of Baltimore, 1891. Dr. James F. McShane, health commissioner.

Annual Report of the Board of Health of the City of Reading, Pa., 1891. E. A. Howell, secretary.

Special Report of the Extent and Character of Food Adulterations. By Alex. J. Wedderburn, Washington, D. C.

Annual Report of the Trustees of the State Hospital for the Insane, Warren, Pa., 1891. John Curwen, M. D., superintendent.

Papers on the Epidemic of Influenza from 1889 to 1892. By Roland G. Curtin, M. D.

Seventh Annual Report of the Board of Health of Altoona, Pa., 1891. Dr. C. H. Closson, secretary.

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Report of the Friends Asylum for the Insane, Frankford, Philadelphia.

Purification of Water by Chemical Treatment. Willis G. Tucker, M. D., Albany, N. Y.

Lists of Officers and Members of the American Public Health Association, and Officers and Members of all State Boards of Health in United States and Provincial Boards of Health in Canada. Dr. Irving A. Watson. Three copies.

Seventh Annual Report of the Board of Health of the City of Newport, R. I. F. R. Rankin, M. D., secretary.

Twenty-sixth Annual Report of the Homœopathic Hospital and Dispensary of Pittsburg, Pa.

Annual Report of Chief Inspector of Milk of Philadelphia, 1891.

Ordinance and Rules of the Board of Health of the City of Hazleton, Pa. James B. MacCartney, secretary.

Report of Quarterly Publications of the American Statistical Association.

Report of the Sewerage of the District of Columbia. Engineer Commissioner, Washington, D. C.

Eleventh Annual Report of the Board of Health of Detroit. Samuel P. Duffield, M. D., health officer.

Catalogue of Licensed Physicians of Florida. Dr. Joseph Y. Porter.

LIST OF BOOKS PURCHASED FROM NOVEMBER 16, 1891 TO OCTOBER 26, 1892.

Foster's Encyclopædic Medical Dictionary. Vols. I and II, $22.00.

United States Official Postal Guide, 1892, $2.50.

Bullinger's Postal and Shipper's Guide, for United States and Canada, 1892, $3.00.

Essentials of Bacteriology, M. V. Ball, M. D., $1.00.

The Farmers' Veterinary Adviser, by James Law, $2.40.

Fever Nursing, by J. C. Wilson, A. M., M. D., $0.80.

The Principles of Bacteriology, by A. C. Abbott, M. D., $1.60.

A Practical Guide to Meat Inspection, by Thomas Walley, M. R. C. V. S., Edinburgh, $3.20.

The Lepers of our Indian Empire, by Wellesley C. Bailey, Edinburgh, $2.00.

Medical and Dental Register Directory and Intelligencer of Pennsylvania, New Jersey and Delaware, $1.00.

Reports and papers of the American Public Health Association, vol. XVII. By subscription.

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MEDICAL AND SANITARY PERIODICALS RECEIVED FROM NOVEMBER 16, 1891, TO OCTOBER 26, 1892.

Abstract of Sanitary Reports. Published at the Marine Hospital Bureau, Washington, D. C. Exchange. Weekly. Three copies.

Annals of Hygiene. Published by Sanitary Publishing Company, Philadelphia. Exchange. Monthly. Six copies.

The Monthly Bulletin. A Record of Sanitary Progress, Public Health and Mortality. Rhode Island State Board of Health. Monthly. Free.

Florida Health Notes. Florida State Board of Health Official Bulletin. Monthly. Free.

Bulletin of North Carolina State Board of Health. Monthly. Exchange.

Public Health in Minnesota. Minnesota State Board of Health. Monthly. Exchange.

State Board of Health Bulletin of Tennessee. Monthly. Exchange.

Monthly Bulletin of the Iowa State Board of Health. Exchange.

The Monthly Sanitary Record. Ohio State Board of Health. Exchange.

The Sanitary Inspector. State Board of Health of Maine. Monthly. Exchange.

Journal D'Hygiéne Populaire. Conseil. Provincil d'Hygiéne et da la Société d'Hygiéne de la Province de Québec. Exchange

The Medical and Surgical Reporter. Weekly. Exchange.

New England Medical Monthly. Exchange.

Lehigh Valley Medical Magazine. Monthly. Exchange.

The Sanitary News. Weekly. By subscription.

The Texas Sanitarian. Monthly. Exchange.

Anti-Adulteration Journal.

The Journal of the American Medical Association. Weekly. By subscription.

The Medico-Legal Journal. Monthly. By subscription.

The Journal of Comparative Medicine and Veterinary Archives. Monthly. By subscription.

The Sanitarian. Monthly. By subscription.

The Engineering News. Weekly. By subscription.

The American Analyst. Bi-monthly. Free.

The Engineering Record. Weekly. By subscription.

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APPENDIX M.

FIFTH ANNUAL REPORT OF THE STATE PHARMACEUTICAL EXAMINING BOARD OF PENNSYLVANIA.

REPORT OF THE STATE PHARMACEUTICAL EXAMINING BOARD OF PENNSYLVANIA FOR THE YEAR ENDING JUNE 30, 1892.

PHILADELPHIA, *November 17, 1892*

To His Excellency ROBERT E. PATTISON, *Governor:*

SIR: In compliance with the provisions of section four of the "act to regulate the practice of pharmacy and sale of poisons, and to prevent adulterations in drugs and medicinal preparations in the State of Pennsylvania," approved May 24, 1887; I have the honor to transmit the fifth annual report of the board, for the year ending June 30, 1892.

Very respectfully,

ALONZO ROBBINS,
President.

MEMBERS OF THE BOARD.

Alonzo Robbins, president, Philadelphia.
Andrew B. Burns, secretary, Montrose.
Adolph J. Tafel, treasurer, Philadelphia.
Charles T. George, Harrisburg.
Louis Emanuel, Pittsburg.

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REPORT.

The board held the four regular quarterly meetings and examinations during the year ending June 30, 1892.

The first meeting was held in the High school at Williamsport, on Tuesday, July 14, 1891.

Andrew B. Burns, of Montrose, was elected secretary, and Adolph J. Tafel, of Philadelphia, was elected treasurer of the board.

Fifty-one candidates appeared for examination; thirty-three applying for Registered Pharmacist's certificates, and eighteen for Qualified Assistant's certificates. Eleven of the former, and ten of the latter class were successful.

Two new members of the board were present at this meeting: Charles T. George of Harrisburg, in place of H. B. Cochran, resigned; and Louis Emanuel of Pittsburg, in place of F. H. Eggers, whose term expired.

The first session of the second meeting was held in the Central High school at Philadelphia, on Monday, October 19, and the second session was held in the City Council chambers at Pittsburg, on Tuesday, October 20, 1891.

Two hundred and fourteen candidates appeared for examination; 105 applying for Registered Pharmacist's certificates, and 109 for Qualified Assistant's certificates. Thirty-nine of the former, and seventy-two of the latter class were successful.

The third meeting was held in the Central High school at Philadelphia, on Monday, January 18, 1892.

Two hundred and twenty-one candidates appeared for examination; 106 applying for Registered Pharmacist's certificates, and 115 for Qualified Assistant's certificates. Twenty-eight of the former, and fifty-seven of the latter class were successful.

The fourth meeting of the year was held in the hall of the House of Representatives at Harrisburg, on Monday, April 25, 1892.

Two hundred and twelve candidates appeared for examination; 151 applying for Registered Pharmacist's certificates, and sixty-one for Qualified Assistant's certificates. Seventy of the former, and twenty-nine of the latter class were successful.

The number of persons examined during the year was 698.

The number successful in passing the examination was 316; 148 obtaining Registered Pharmacist's certificates, and 168 Qualified Assistant's certificates.

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The total number of certificates issued up to June 30, 1892, is 6,908. This includes all persons registered by reason of being engaged in the business at the passage of the act, and those registered under the eleventh section, as well as those registered by examination.

An alphabetical list of those registered during the year is herewith appended.

Balance of money on hand at last report; three thousand seven hundred and seventy-four dollars and twenty-seven cents ($3,774.27); amount received during the year; one thousand two hundred and fifty-one dollars and ninety-five cents ($1,251.95); total receipts, five thousand and twenty-six dollars and twenty-two cents ($5,026.22).

Amount disbursed during the year, two thousand four hundred and forty-two dollars and eighty-three cents ($2,442.83).

Balance on hand June 30, 1892, two thousand five hundred and eighty-three dollars and thirty-nine cents ($2,583.39).

A detailed statement by the treasurer is herewith appended.

The work of the board during the year was considerably increased by the greater number of applicants for examination. That so many of these applicants were unsuccessful is not owing to excessive severity of the board, but is due to the fact that many of the applicants are either entirely unprepared, or have undergone merely superficial preparation. The board does not depend too strongly upon scientific preparation, and any candidate who has had the required experience in a good store, under a practical and competent teacher, will find himself in possession of knowledge that will go far to enable him to pass the examination.

As before reported, the fees as fixed by the pharmacy act are entirely too low to yield a sufficient sum to properly pay for the enforcement of the law, the amount of money received being barely sufficient to meet the expenses of the regular meeting of the board. The fee for examination and registration in most other states is five dollars, with, in some states, one or two dollars for annual renewal of registration, while in Pennsylvania, the fee for examination and registration is but two dollars, and one dollar every *three* years for renewal.

Our board has never yet held an examination at which the expenses have not greatly exceeded the receipts. An increase of the examination fee to five dollars seems like a reasonable request. In case of failure to pass, the applicant might have the privilege of re-examination free within a year.

The eleventh section of the pharmacy act, if unrestricted, will render the entire act nugatory. The board has limited registration under this section as much as possible, yet it is so unfair to the pharmacists that its presence is a cause of continual complaint. At the recent annual meeting of the State Medical Society, that association of representative physicians passed resolutions strongly favoring the repeal of this obnoxious section. The State Pharmaceutical Association will present a bill

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for its repeal at the approaching session of the legislature, which, if enacted, will remove the one really unjust part of the pharmacy act.

Upon evidence furnished by the State Pharmaceutical Association, the board commenced prosecutions against several persons for violating the ninth section of the act, by the sale of *adulterated* medicines. The persons accused were arrested and held under bail for court. True bills were found against them, but whilst awaiting trial, Frederick J. Knaus, an attorney employed by the board, went to the District Attorney's office in Philadelphia, and made such statements as induced that officer to *submit* the bills, and ask for an acquittal without any real trial. The action of Mr. Knaus was taken entirely without the knowledge or consent of the board, and as soon as it was learned of, every effort was made to have him punished, but chiefly through lack of funds to pay counsel, the matter has been allowed to rest.

To the President and Members of the Pennsylvania Pharmaceutical Association:

GENTLEMEN: I feel it my duty to report as briefly as possible the facts resulting from the evidence procured by your former committee on adulterations.

This evidence was placed in my hands about the first of July, 1891, and upon my request to Mr. Wallis, the chairman of the committee, Dr. Henry Leffman sent to me on July 8, the report of his analysis of the samples of laudanum on a separate paper, with an affidavit attached thereto. This report is as follows, omitting the names of two persons not yet prosecuted:

715 WALNUT ST., PHILADELPHIA, *July 8, 1891.*

ALONZO ROBBINS, Esq.

DEAR SIR: I transmit herewith the report of the analysis of the samples of laudanum sent to me by Mr. R. A. Wallis:

Lab. No.	*Date.*	*Name.*	*Morphine in 50 CC.*	*Extract.*
4769	March 14,	D. S. Wiltberger, 233 N. 2d,	0.320	1.36
4771	March 14,	C. H. Butterworth, 69 N. 2d,	0.270	1.22
4772	March 16,	Clement & Hinchman, 319 N. 2d,	0.305	1.45
4773	March 17,	B.,	0.080	0.77
4774	March 17,	G.,	.265	1.45
4791	April 4,	O. B. Server, 6th and Race,		1.60

In the last sample no weighable quantity of morphine could be obtained. The sample from Clement & Hinchman was provided with a label stating that the preparation was of officinal strength.

Yours,

HENRY LEFFMAN.

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STATE OF PENNSYLVANIA, } ss:
COUNTY OF PHILADELPHIA, }

Dr. Henry Leffman, being duly affirmed according to law, deposes and says that the above figures, to the best of his knowledge and belief, are correct, and that in his opinion said samples were not prepared in accordance with the requirements of the United States Pharmacopœia.

HENRY LEFFMAN.

Affirmed and subscribed before me, the eighth day of July, Anno Domini 1891.

THOMAS D. SIMPSON,
Notary Public.

The foregoing report from Dr. Leffman was laid before the State Pharmaceutical Examining board on the 14th of July, 1891, at its meeting in the city of Williamsport, and as it appeared that all of the samples reported contained much less than one-half of the officinal percentage of morphine, the Board directed that proceedings should be commenced against the persons named in the report. Three of these persons were engaged in the retail drug business and three in the wholesale.

According to the directions of the board, immediately upon my return to Philadelphia I placed the matter in the hands of Frederick J. Knaus, an attorney-at-law, of that city, and directed him to prosecute at once. As prior to engaging in the profession of law Mr. Knaus had been a pharmacist in Philadelphia, it therefore seemed to me that he was especially fitted to appear in these cases.

After various delays, Oliver B. Server was arrested last fall and upon a hearing at the city hall was held for trial at court. Then, although I visited the attorney's office once or twice a week until March of the present year, I could not induce him to commence prosecutions in the other cases. Finally, late in March, I went to the city hall myself and had the warrants issued and the arrests made. At the hearing C. H. Butterworth and Clement & Hinchman were held to bail for trial in court, Mr. Knaus was present at the hearing and managed the cases very well.

D. S. Wiltberger was sick and could not be present at the central station, but his case was heard the following week at the magistrate's court. Mr. Knaus was present then also and asked me to drop the case against Mr. Wiltberger, and as I declined to do so he said he would drop it, which he did; this left me without any lawyer, but the hearing was not finished that day, and when it came up again I had another attorney, but when the case was called the magistrate said that he would dismiss it. The accused admitted that he had sold weak laudanum, but claimed that after Server's arrest he had made it full strength. He further stated that the weak laudanum was not sold to physicians or druggists, but only to country stores. Upon being asked why people who purchased from such stores should not have pure medicines, he made no reply.

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Soon after I learned that true bills had been found against C. H. Butterworth and Clement & Hinchman, but as they had given bail I did not expect their trial to occur much before fall. However, about nine o'clock on the morning of May 25, I received a note from Mr. Knaus simply saying that both cases would be tried that day. I at once went to the court and got there just in time to see them begin. Butterworth was called, and Dr. Leffman went on the witness stand. I did not see Mr. Knaus present, and after a few moments other cases were called, and I left with the impression that our cases had been postponed, owing to the absence of Mr. Knaus, as Server's trial had once been postponed by reason of Mr. Knaus being absent when it was called.

I was greatly astonished to see in the newspapers next morning that the cases had been *submitted* and verdicts of not guilty taken, at the suggestion contained in a letter written by Mr. Knaus to Assistant District Attorney Boyle.

I immediately wrote to District Attorney Graham and the following newspaper cuttings will best explain the matter as far as it has yet proceeded.

[*Philadelphia Press, May 22, 1892.*]

The unexpected arrest of six leading wholesale druggists on last Thursday, on the charge of adulterating laudanum, has created a sensation in drug circles, not only on account of the high character and position of the druggists arrested, but on account of the manner in which the arrests were made. Every one of the defendants has heretofore been above suspicion, and they emphatically denounce their arrest as malicious and assert their laudanum was not adulterated. The druggists who were arrested are L. Hassell Lapp, Donaldson Marshall, Henry Beattes, of Beattes, Miller & Lambert, Clayton Shoemaker, of Shoemaker & Bush, Frank H. Heritage, of Finnerty, McClure & Co., and John A. Wright. Mr. Lapp is president of the Drug Exchange.

The peculiarity of the arrest consists in the fact that the prosecutions are made by a private individual, G. M. Bennett, who is said to be a drug salesman, who claimed to represent the Druggists' Protective Association. This association is unknown in drug circles, the only association being the Apothecary's Union and the Druggists' Trade Association, neither of which authorized the prosecution. The State Board of Pharmacy also refused to countenance the prosecution.

Mr. Shoemaker and Messrs. Finnerty, Heritage and McClure attribute the prosecution to malice and say they will fight it to the end. They claim that the animus is shown by the fact that Bennett, who brought the prosecution, was in the employ of C. H. Butterworth & Co., on the day he alleges he purchased the laudanum, April 21. On May 4, some of the defendants received notice from Mr. Butterworth that Bennett was no longer in his employ. Last March Butterworth was one of three

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druggists prosecuted by the State Board for adulterating his laudanum, and he is still under bail for trial.

After Bennett secured the laudanum he had it analyzed by a chemist named O. M. Jenks, who it is claimed is not a regular drug chemist, but what is known as a sugar chemist.

President Robbins, of the State Board of Pharmacy said yesterday, that some time ago Bennett and Jenks came to him with an analysis of the laudanum, which it was claimed, was only 82½ per cent. of the required strength of opium. They wanted Mr. Robbins to swear out the warrants for the arrest of the defendants, and Bennett stated, Mr. Robbins says, that there was plenty of money back of the prosecution. Mr. Robbins not knowing either Bennett or Jenks, suggested that as Mr. Jenks was not an expert known to the courts, that Mr. Bennett should take the laudanum to Professor Henry Leffman for analysis. Then if Professor Leffman's analysis warranted a prosecution, he would report to the State Board, and under their direction bring the prosecutions. That was the last Mr. Robbins heard of the matter until, to his surprise, he heard of the arrests.

Yesterday Mr. Finnerty and Mr. Heritage both stated that they attributed the prosecution to Mr. Butterworth. They said that the purchase of the laudanum, a dozen bottles, was made by Russell Sheppard, a boy in the employ of Shull, Wireback & Co., who are customers of Finnerty, McClure & Co., and who have a running account.

Their suspicions were aroused by the fact that Sheppard paid cash for the laudanum. Their suspicions, they say, were confirmed on the day of the hearing by seeing young Sheppard in the magistrate's office. Now, they positively assert, they are satisfied their suspicions were correct, for they declare young Sheppard admitted in the presence of at least two witnesses that he bought the laudanum for Mr. Butterworth.

They have in their possession a circular signed C. H. Butterworth & Co., issued a short time ago, which they claim contains a threat. The circular, or "Notice," as it is headed, contains, among other things, the following:

"We understand that some of our competitors are reporting that we are selling laudanum that is not up to the standard. We wish to say in reply, briefly, that the gentlemen (so-called) in question do not know pure laudanum from impure when they see it, and they, being unable to undersell us or hold the drug trade, had to resort to a business which every good business man can see at once is cowardly, unmanly, debase, unchristian, wicked and rotten to the core. We have no disposition, had we time, to talk about our neighbors.

"It is through this class of people that it was brought about to make trade, and this class of people cannot say that they are without sin; due time will reveal all the facts in the case, and you will behold the character of these men to your disgust."

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Mr. Butterworth vigorously denied having any connection with the present prosecutions. He said that he had discharged Bennett because he didn't like his business method. "I've had enough trouble over my own arrest," said Mr. Butterworth bitterly, "without hunting more trouble. My arrest was an outrage, and I know it was inspired by certain people to injure my business. They have succeeded, too, for it has almost ruined me."

From what the defendants say, some of them will probably take legal action against Bennett for malicious prosecution. Should the grand jury find true bills against them they will fight the case to a finish, and question the credibility of the expert.

In speaking of Bennett's liability, President Robbins said that he did not think that such prosecutions could be brought by private individuals, but should be brought by the State board, the pharmacy law making it the duty of the board to investigate and prosecute all violations of the provisions of this law. Mr. Robbins thought that in taking the responsibility of prosecuting, Mr. Bennett laid himself open to legal liability.

[*Philadelphia Press, May 27, 1892.*]

President Alonzo Robbins, of the State Board of Pharmacy, yesterday wrote to District Attorney Graham for information regarding the abandonment of the prosecution and the submission of the bills last Wednesday against Druggists C. H. Butterworth, John Clement and Walter L. Hinchman, charged with adulterating laudanum in violation of the pharmacy act of 1887. In submitting the bills Assistant District Attorney Boyle read to the court a letter from F. J. Knaus, who acted as the legal representative of the State board of Pharmacy, in which he (Mr. Knaus) stated that he was willing that the bills should be submitted as they were the first cases brought under the act, and the arrests had been made without warning.

Last night Mr. Robbins emphatically stated that he had never authorized Mr. Knaus to abandon the prosecution, had not been consulted by Mr. Knaus in the matter, and did not know Mr. Knaus intended taking such action. Mr. Robbins said that he had received a notice from Mr. Knaus late Wednesday morning, stating that the cases were coming up in court. That is all the information he received from Mr. Knaus. He hurried to court, but the room was crowded, and he had to stand pretty far back. He said that he did not know that the bills had been submitted on the strength of Mr. Knaus' letter to the court until he read the account of the court proceedings in the newspapers yesterday morning.

When Mr. Robbins learned the facts he was indignant and wrote the district attorney in regard to the matter. He refused to state what he

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said in his letter to Mr. Graham, but there is no doubt there will be a strict investigation of the matter.

It is claimed that in one of the cases the laudanum was 50 per cent. below the opium strength required by the Pharmacopœia of 1880.

Assistant District Attorney Boyle said last night that the first he knew about the cases was a few days ago when Mr. Sharp, who represented one of the defendants, either Mr. Hinchman or Mr. Clement, called at the district attorney's office and asked if the cases were to be prosecuted, stating that he understood the bills were to be submitted. Mr. Boyle replied that he knew nothing about the cases, and for the first time learned that they were down for trial for Wednesday. He told Mr. Sharp he had better be on hand at that time as the bills might not be submitted.

Shortly after that Professor Leffmann, Mr. Sharp, Owen B. Jenkins, counsel for Mr. Butterworth, and Mr. Knaus, who he understood was acting for the State Board of Pharmacy, met together in his office. Professor Leffmann informed him that it was doubtful if a conviction could be secured, as the laudanums met the requirements of a Pharmacopœia previous to that of 1880. Mr. Knaus also informed him that he did not care to push the prosecution any further, and suggested submitting the bill. Mr. Boyle, under the circumstance, consented to submit the bills if Mr. Knaus and Professor Leffmann would make their statements publicly in the court.

Mr. Knaus said he could not do that as he had another engagement on Wednesday, but said he would write a letter to that effect to the court. This he did, and Mr. Boyle read the letter to Judge Bregy, and Professor Leffmann gave his testimony to the effect that in one of the cases the laudanum was in accord with one of the old Pharmacopœia standards.

Mr. Boyle says that he regarded Knaus as acting for the State board, and had no idea that he was not acting with the full concurrence of the board.

Mr. Knaus did not appear in court at all on Wednesday, but he did appear before Magistrate Pole as the legal representative of G. M. Bennett, the drug salesman who instituted the prosecution against Mr. Lapp and the five other druggists, who were arrested last week on the charge of adulterating their laudanum.

Yesterday Mr. Knaus admitted that he had not consulted Mr. Robbins in reference to the submission of the bills, but had sent him a notice that the cases were coming up on Wednesday morning. He said he had advised against the arrest of Butterworth and the other defendants prosecuted by the State board without first giving them notice, and was always of the opinion that the cases should not be prosecuted.

The offense, he said, was a year old when the arrests were made last March, and the defendants had since the first offense complied with the

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law, and he considered that the publicity given to their arrest had been sufficient punishment. He said he had suggested submitting the bills as a lawyer, and did it simply as an individual, giving it as his personal opinion. As counsel he claimed he had a right to abandon the prosecution.

Mr. Knaus admitted that he now represents Bennett in the prosecution of the druggists arrested last week, and claims that the case is very different, and that the arrests of Butterworth, Hinchman and Clement were a warning to the other druggists. He declined to state how he had come to represent Bennett, and when asked what Bennett was doing now for a living he frankly stated that he did not know.

Professor Leffmann said that it was doubtful whether a standard fixed by the Pharmacopœia could secure a conviction, as it was rather a vague thing what laudanum was. There were three standards of the Pharmacopœia, he said. The standard of 1860 requires not less than 7 per cent. of morphine, and does not state what kind of opium shall be used. The standard of 1870 requires not less than 10 per cent. of morphine, and does not state what kind of opium shall be used. The standard of 1880 requires not less than 12 per cent. of morphine, and states that the opium must be from Asia Minor. This opium, Professor Leffmann said, is considerably stronger than others, and that with the increase of 5 per cent. in quantity makes the opium strength of the standard of 1880 twice as great as that of 1860.

"Mr. Boyle asked me," said Professor Leffmann, "whether the laudanums I had analyzed did not correspond with those of previous Pharmacopœias. I told him that they did. And so they did. They were up to the requirements of the Pharmacopœia of 1860."

Mr. Robbins said last night that he would now have to explain to the State Pharmaceutical Association how the prosecutions had been lost. He said that the association had secured the evidence for the prosecutions at considerable expense, and the State Board of Pharmacy had carefully weighed the evidence before bringing the prosecution. He said it was true that the laudanum had been purchased nearly a year before the arrests had been made, but that the utmost care had been exercised before making the arrests. He said Mr. Knaus had no right to complain that the offenses were a year old when the arrests were made, as he had urged Mr. Knaus to make the arrests last fall, but Mr. Knaus had put it off and finally refused to cause the arrests. Then he, Mr. Robbins, had to swear out the warrants himself.

[*Philadelphia Press, May 28, 1892.*]

Alonzo Robbins, president of the State Board of Pharmacy, who wrote to District Attorney Graham in regard to the submission of the bills against druggists C. H. Butterworth, John Clement and Walter L. Hinchman, as reported in yesterday's *Press*, last evening received a re-

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ply from Assistant District Attorney Boyle. In his reply Mr. Boyle said:

"Your letter of the 26th to Mr. Graham has been referred to me with instructions to forward a reply and to inclose a copy of Mr. Knaus' letter. In accordance with these instructions and with your request I send herein the copy asked for."

Following is the copy of Mr. Knaus' letter to Mr. Boyle, in reference to the cases against Butterworth, Hinchman and Clement:

"As you know, I represent the prosecution in the above; but in view of all the circumstances, especially considering that their's were the first cases prosecuted under the pharmacy act of 1887, and without previous notice or warning, and that I am convinced that they are complying with the act, the injury that their business has already suffered, and the length of time that elapsed between the sale of the goods in question and the commencement of the prosecution (about one year), I think the ends of justice will be subserved by the submission of the bills in both cases."

The letter of Mr. Robbins contained a newspaper clipping giving an account of the submission of the bill. In his letter Mr. Robbins says:

"I wish especially to call your attention to the last paragraph, which states that Mr. Boyle had received a letter from F. J. Knaus, attorney for the prosecution, in which Mr. Knaus stated that he was willing that these cases should be submitted. Under the law it was my duty to act as prosecutor in these cases. Mr. Knaus was my attorney, but if he wrote any such letter it was without consultation with me, and entirely without my knowledge or consent. I feel that Mr. Knaus has grossly betrayed the trust I placed in him, and as it is part of my duty to report these prosecutions to the Governor, I respectfully ask that you will send me a copy of the letter Mr. Knaus sent your assistant, Mr. Boyle."

Mr. Graham said yesterday that he did not intend to take any further action in the matter, and that if Mr. Knaus had betrayed his trust with Mr. Robbins that was a matter for settlement between Mr. Robbins and Mr. Knaus. Mr. Graham further said that he thought the cases had been properly disposed of in view of the only evidence the Commonwealth had; that of Professor Leffmann. Mr. Graham was asked if the United States Pharmacopœia could be depended upon as a standard in the prosecution of these cases. He said that he did not know that it could. When asked if the legislature had made the Pharmacopœia a standard whether or not it would be a violation of the law not to comply with that standard, he said it would.

It would not be right to fail to call your attention to the testimony of Dr. Leffmann, the prosecutions were based entirely on his report in which he states the amount of morphine found in the samples of laudanum obtained from the persons he named therein.

Stating these amounts of morphine as percentages they would be as follows:

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D. S. Wiltberger,	0.64
C. H. Butterworth,	0.54
Clement & Hinchman,	0.61
B.,	0.16
G.,	0.53
O. B. Server,	Not weighable.

Now as the United States Pharmacopœia directs that powdered opium must contain from 12 to 16 per cent. of morphine, and as laudanum is directed to contain 10 per cent. of such opium, the percentage of morphine in laudanum would be from 1.20 to 1.60, therefore it is evident that not one of the samples reported contained one half of the average official percentage of morphine.

At the hearing at the city hall, Dr. Leffmann testified that the sample obtained from C. H. Butterworth contained less than one-half of the amount of morphine required by the United States Pharmacopœia, and that the analysis of the samples obtained from Clement & Hinchman showed about the same results.

When the meeting was held at which it was proposed to submit these bills, and when Dr. Leffmann was on the witness stand when the bills were submitted, considerable is reported to have been said about the great difference in strength between the opium and laudanum of the 1880, 1870 and 1860 Pharmacopœias. Now the facts are as follows: The Pharmacopœia of 1860 said that opium (not powdered opium) should yield *at least* seven per cent. of morphia by the officinal process, see page 41, U. S. P., 1860. And directed that from two and one-half troy ounces of dry and powdered opium, two pints of laudanum should be prepared; see page 332, U. S. P., 1860.

The Pharmacopœia of 1870 said that opium when dried at 212° until it ceases to lose weight, should yield *at least* ten per cent. of morphia by the officinal process, see page 41, U. S. P., 1870.

Now as crude opium in lumps usually contains about 20 per cent. of water, it is evident that there was no practical difference whatever between the opium and laudanum of 1860 and 1870. In both cases two and one-half troy ounces of powdered opium being used for two pints of laudanum.

Such laudanum then would contain *at least* one per cent. of morphine, while by Dr. Leffmann's own report C. H. Butterworth's laudanum contained only 0.54 per cent., and Clement & Hinchman's only 0.61 per cent. The difference in strength between the laudanum of 1870 and that of 1880 is also greatly exaggerated. The laudanum of 1880 contains ten parts of powdered opium in one hundred parts of the finished preparation, while the laudanum of 1870 contained nine parts of powdered opium to one hundred parts of the finished preparation. See page 455, U. S. P., 1880.

Furthermore for some years prior to 1860 the United States customs laws required that all crude opium imported should contain at least nine per cent. of morphine.

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From the foregoing references and figures it is plainly evident that the laudanum of C. H. Butterworth and Clement & Hinchman were very little if any nearer the standard of 1860 or 1870, than they were of 1880.

The great difference between Dr. Leffmann's report to the Pharmacy Board, and what he is reported to have said at the district attorney's office and to the newspaper reporters, would be a proper subject for very close and searching investigation.

A. J. TAFEL, *Treasurer, in Account with the State Pharmaceutical Examining Board of Pennsylvania.*

DR.

1891.			
June	22,	To balance on hand as per treasurer's report of this date transferred from Ex-Treasurer F. H. Eggers, Warrant No. 122, ...	$3, 774 27
July	24,	To cash from H. B. Cochran, ...	30 95
Oct.	27,	To cash from A. B. Burns, ...	391 00
1892.			
Jan.	23,	To cash from A. B. Burns, ...	381 00
March	10,	To cash from A. B. Burns, ...	100 00
May	6,	To cash from A. B. Burns, ...	349 00
			$5, 026 22
May	25	To cash in treasury, ...	$2, 583 39

CR.

1891.				
July	24,	By cash to F. H. Eggers, ...	warrant 123,	$42 44
		By cash to C. T. George, ...	warrant 124,	54 49
		By cash to L. Emanuel, ...	warrant 125,	83 10
		By cash to Lancaster *Examiner*, . .	warrant 126,	25 70
		By cash to H. B. Cochran, ...	warrant 127,	110 30
		By cash to A. B. Burns, ...	warrant 128,	96 25
		By cash to A. J. Tafel, ...	warrant 129,	54 95
		By cash to Alonzo Robbins, ...	warrant 130,	122 02
		By cash to C. T. George, ...	warrant 131,	122 74
		By cash to L. Emanuel, ...	warrant 132,	49 95
		By cash to A. J. Tafel, ...	warrant 133,	79 60
		By cash to A. B. Burns, ...	warrant 134,	185 11
		By cash to G. B. Reimensnyder, . .	warrant 135,	80 90
		By cash to Jas. P. Taylor, ...	warrant 136,	16 00
		By cash to Lancaster *Examiner*, . .	warrant 137,	24 40
		By cash to Miss H. A. Burns, . . .	warrant 138,	50 00
		By cash to A. Robbins, ...	warrant 139,	185 50

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CR.

1892.				
Feb.	3,	By cash to A. J. Tafel, ...	warrant 140,	60 85
		By cash to C. T. George, ...	warrant 141,	85 05
		By cash to Lancaster *Examiner*, . .	warrant 142,	30 21
		By cash to A. B. Burns, ...	warrant 143,	148 60
		By cash to L. Emanuel, ...	warrant 144,	103 65
		By cash to A. Robbins, ...	warrant 145,	116 60
May	25,	By cash to L. Emanuel, ...	warrant 146,	75 62
		By cash to C. T. George, ...	warrant 147,	54 95
		By cash to A. J. Tafel, ...	warrant 148,	73 75
		By cash to A. B. Burns, ...	warrant 149,	144 00
		By cash to A. Robbins, ...	warrant 150,	166 10
		By cash to balance, ...		2,583 39
				$5,026 22

PHILADELPHIA, *May 25, 1892.*

Respectfully submitted,

A. J. TAFEL,

Treasurer of the State Pharmaceutical Examining Board of Pennsylvania.

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REGISTERED PHARMACISTS OF PENNSYLVANIA.

Angle, Jay W	Eighth and Green street	Philadelphia.
Armstrong, Eugene C	Chester	Delaware county.
Bailey, Arthur H	126 Locust street	Harrisburg.
Bauer, George L	1611 Sansom street	Philadelphia.
Beers, Benjamin F	Wilkes-Barre	Luzerne county.
Bender, Edward A	4099 Lane avenue	Philadelphia.
Berg, Leroy	Tyrone	Blair county.
Blackman, Augustus S	133 N. Eleventh street	Philadelphia.
Blackwood, Russell T	2002 Tioga street	Philadelphia.
Boltz, Elias K	336 S. Second street	Philadelphia.
Brown, Anthony P	825 Capouse avenue	Scranton.
Bruce, William T	835 Willow street	Lebanon.
Bulger, Howard H	Brownsville	Fayette county.
Butler, William J	80 Northampton street	Wilkes-Barre.
Byrne, Daniel	Carbondale	Lackawanna county.
Calbaugh, Edgar M	1005 Green avenue	Altoona.
Carey, Harry C	800 Walnut street	Philadelphia.
Chapman, B. Grant	Armat and Willow avenues	Philadelphia.
Conard, George M	2558 N. Seventh street	Philadelphia.
Conrad, Henry W	Osterburg	Bedford county.
Cooper, Herbert	Twenty-third and Callowhill streets	Philadelphia.
Cornell, Wharton L	1717 Rodney street	Wilmington, Del.
Crummie, George J	1410 Dauphin street	Philadelphia.
Dawson, Frank	1046 S. Fifth street	Philadelphia.
Dierolf, Charles B	Mount Joy	Lancaster.
Doench, Theodore	1607 Ridge avenue	Philadelphia.
Donecker, Edwin A	226 N. Ninth street	Allentown.
Douthett, George S	264 Forty-fourth street	Pittsburg.
Duff, Harry A	315 Smithfield street	Pittsburg.
Dutt, Frederick A	1011 Arch street	Philadelphia.
Eisenhart, Edwin K	3875 Aspen street	Philadelphia.
Elliott, Arthur H	Mansfield	Tioga county.
Eppstein, Jacob	345 N. Twelfth street	Philadelphia.
Ferguson, Enoch P	Coatesville	Chester county.
Fisher, Joshua F	Catawissa	Columbia county.
Fisher, Margaret E	Springboro	Crawford county.
Flagler, Steward	Stroudsburg	Monroe county.
Fry, Harry R	Morton	Delaware county.
Fry, Nelson S	Harrisburg	Dauphin county.
Gill, Charles A	Hulmeville	Bucks county.
Gillespie, E. N	Freeport	Armstrong county.
Glenk, Robert	1542 N. Nineteenth street	Philadelphia.
Goldsmith, Martin	611 Elm street	Camden, N. J.
Goll, Philip	Second and Thompson street	Philadelphia.
Grotevent, J Frederick	Harrisburg	Dauphin county.
Hague, William H	6219 Pennsylvania avenue	Pittsburg.
Hahn, Herman F	915 N. Third street	Harrisburg.
Hainer, Robert M	6 Pittsburg street	Newcastle.
Harbold, Curtis A	2621 Girard avenue	Philadelphia.
Hayes, Robert G. H	15 High street	Bellefonte.
Hays, Joseph A	147 S. Eighteenth street	Pittsburg.
Henderson, Charles P	541 E. Thompson street	Dover.
Hershey, Emanuel R	122 S. Queen street	Lancaster.
Hess, Harry R	Montgomery Station	Lycoming county.

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Holberg, Ferdinand	2158 N. Nineteenth street	Philadelphia.
Horning, John	24 S. Main street	Bethlehem.
Howells, John J	Luzerne	Luzerne county.
Huber, Charles F.	6130 Pennsylvania avenue	Pittsburg, E. E.
Hugus, Richard T	Delmont	Westmoreland county.
Hutchinson, B. T	Bangor	Northampton county.
Irvin, Robert Hammond	Saint Clair	Schuylkill county.
Jacob, Walter W.	146 N. Twentieth street	Philadelphia.
Jamison, Samuel C.	59 Fulton street	Pittsburg.
Johnson, William D	Le Raysville	Bradford.
Kahl, Charles W.	236 Fifth avenue	McKeesport.
Keiper, Harvey L.	135 N. Seventh street	Allentown.
Kephart, Thomas A. C.	436 Franklin street	Philadelphia.
Kline, William J. K.	214 N. Main street	Greensburg.
Koons, Milton H.	24 N. Eleventh street	Allentown.
Krauss, Frederick	1712 N. Third street	Philadelphia.
LaDow, Addington	Eighth street and Oak lane	Philadelphia.
Landis, Charles P.	4218 Pechin street	Philadelphia.
Lewis, William H	Seventh and Oak streets	Mount Carmel.
Loftus, John J.	237 Wyoming avenue	Scranton.
Lohneyer, Henry L.	2002 Sarah street	Pittsburg.
Long, William H., Jr.	1327 South street	Philadelphia.
Lorah, Lester L.	Emlenton	Venango county.
Lord, Agna	Norristown	Montgomery county.
Mackey, George C.	Belvidere	Warren county, N. J.
Martz, William K.	Sunbury	Northumberland county.
McAniff, Hugh P.	153 Lincoln street	Wilkes-Barre.
McBride, James E	South Bethlehem	Northampton county.
McClintock, James	5102 Germantown avenue	Philadelphia.
McDonough, Oscar T.	Charleroi	Washington county.
McLaughlin, Philip C.	1725 Poplar street	York.
Meyers, Louis J	Conshohocken	Montgomery county.
Miller, Daniel L.	Waynesboro'	Franklin county.
Miller Frank	Danville	Montour county.
Miller, John H.	2602 Germantown avenue	Philadelphia.
Milliken, William H.	1702 Burton street	Philadelphia.
Mitchell, Henry	1230 Everett street	Philadelphia.
Mitchell, W. H.	Driftwood	Cameron county.
Mohn, John E	49 Main street	Jersey Shore.
Monie, Thomas	Archbald	Lackawanna county.
Morrison, John L. D.	3611 N. Twenty-third street	Philadelphia.
Moris, Joseph G	3223 Haverford street	Philadelphia.
Morton, Alexander R.	Morton	Delaware county.
Myers, A. Harold	837 Main street	Mount Pleasant.
Myers, William Tice	Eighteenth st. and Germantown av.	Philadelphia.
Neatherton, Samuel O.	21 N. Eleventh street	Philadelphia.
Neff, James W.	Morrisdale Mines	Clearfield county.
Parke, Charles R.	625 Linden street	Scranton.
Pellett, Gordon E.	4000 Chestnut street	Philadelphia.
Peters, Rewellien C.	3348 Market street	Philadelphia.
Pickett, Charles T.	920 Callowhill street	Philadelphia.
Plank, Jacob R	York Springs	Adams county.
Platt, George F., Jr.	4060 Chestnut street	Philadelphia.
Porter, Clifford C.	129 S Main street	Greensburg.
Post, Francis Elmer	646 N. Twelfth street	Philadelphia.
Quail, Charles E.	Auburn	Schuylkill county.
Ramsay, Charles Carroll	976 Marshal street	Philadelphia.
Rankin, James L	Cannonsburg	Washington county.
Read Ralph M.	Osceola Mills	Clearfield county.
Rennecker, Clarence E	Sharon	Mercer county.
Renniman, William J.	52 Main street	Avoca.

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Richards, George W.	Dravosburgh	Allegheny county.
Richardson, Harry	436 Franklin street	Philadelphia.
Riegraf, J. Martin.	1028 Dakota street	Philadelphia.
Riggs, Leander	Elizabeth	Allegheny county.
Rischpeter, Charles F. A. Jr.	Twelfth and Carson streets	Pittsburg.
Rishton, William Sloan	Bloomsburg	Columbia county.
Roach, William Henry	Driftwood	Cameron county.
Roberts, James W	915 Braddock avenue	Braddock.
Sahm, Louis N	1800 N. Twenty-seventh street	Philadelphia.
Schilling, Paul C.	171 Chestnut street	Allegheny.
Schmehl, Irvin S	1207 Race street	Philadelphia.
Shafer, Erwin C	Montoursville	Lycoming county.
Shore, Thomas W	2222 Lambert street	Philadelphia.
Singer, Robert L	333 Market street	Harrisburg.
Slick, Ross M.	Eighteenth and Jefferson streets	Philadelphia.
Smiley, Edwin R.	5504 Vine street	Philadelphia.
Smith, George A.	3875 Aspen street	Philadelphia.
Smith George Lewis	Orrstown	Franklin county.
Smith, Harry Allen	Second and Thompson streets	Philadelphia.
Smith, Herbert J.	1300 S. Fifth street	Philadelphia.
Spang, Charles A.	275 Ridge avenue	Allegheny.
Speer, Edgar Lacy	345 E. Queen street	Chambersburg.
Spencer, Edward T	1631 Arch street	Philadelphia.
Stevens, John C.	State Lunatic Hospital	Harrisburg.
Stiles, Henry A	Main and Bridge streets	Ulster.
Stoffregen, Louis F.	306 N. Centre street	Pottsville.
Sultzbach, Harry M	411 Locust street	Columbia.
Sutton, Samuel	Wilkes-Barre	Luzerne county.
Taggart, George C.	Norristown	Montgomery county.
Tiffany, L. Elbert	Hallstead	Susquehanna county.
Tyler, George C.	1900 Green street	Philadelphia.
Urquhart, George W.	Thirteenth and Dauphin streets	Philadelphia.
Van Valzah, John A.	Hughesville	Lycoming county.
Van Valzah, S. L.	Hughesville	Lycoming county.
Wagaman, Samuel E.	53 N. Main street	Chambersburg.
Walker, Robert A	West Monteray	Clarion county.
Walls, Frank	Fifth and Lombard streets	Philadelphia.
Watkins, Charles J.	Olyphant	Lackawanna county.
Watson, Maurice	Bristol	Bucks county.
Westphal, Karl H	464 N. Seventh street	Philadelphia.
Whitaker, George N.	Fifteenth and Oxford streets	Philadelphia.
White, Charles F.	259 S. Tenth street	Philadelphia.
Wiest, G. F	North Collins	Erie county, N. Y.
Wilhelm, Valentine	164 East street	Allegheny,
Williams, Charles M	1918 Uber street	Philadelphia.
Woodruff, John S	2407 Fairmount avenue	Philadelphia.
Worrall, Harry	Downingtown	Chester county.
Young, Alfred F	254 South Ninth street	Philadelphia.
Ziegler, Albert L	York	York county.
Zimmerman, Howard M	Mount Carmel	Northumberland county.

Qualified Assistants.

Adams, Bentley B.	Atlantic City	Atlantic county, N. J.
Adams, James D	Tenth and Spruce streets	Philadelphia.
Adams, Winfield S	243 Boas street	Reading.
Althouse, Frank J	936 North Forty-second street	Philadelphia.
Anderson, Clarence G	244 North Eleventh street	Philadelphia.
Bachman, Charles F. Jr	51 Liberty street	Allegheny.
Banks, James	Mifflintown	Juniata county.
Benedict William P	1106 Eleventh street	Altoona.

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Berg, LeRoy	133 North Eleventh street	Philadelphia.
Betz, William H	2409 North Sixteenth street	Philadelphia.
Bierman, Valentine	710 South Second street	Philadelphia.
Binkley, Harry J	1019 Vine street	Philadelphia.
Bitner, Winfield S	723 Berks street	Philadelphia.
Blair, Henry C, Jr.	800 Walnut street	Philadelphia.
Blecker. Isaac B	Third and South streets	Philadelphia.
Bowman, Bertram	36 West King street	Lancaster.
Britcher, Milton W	Dillsburg	York county.
Broadway, Jacob	524 South Twentieth street	Philadelphia.
Brown, James R. L	134 South Main street	Greensburg.
Cain, James F	Pittston	Luzerne county.
Campbell, John C	Chicora	Butler county.
Carey, Harry C	1800 Walnut street	Philadelphia.
Clark, Hubert F	Plains	Luzerne county.
Clemons, William G	Kingston	Luzerne county.
Cline, William E	328 Franklin street	Orrstown.
Coffy, Maurice G	123 Commerce street	Lock Haven.
Conard, George M	2558 North Seventh street	Philadelphia.
Connor, E. Brooke	199 West Dauphin street	Philadelphia.
Conyers, Zeb. V	1339 North Fifteenth street	Philadelphia.
Corson, Linwood S	2800 Richmond street	Philadelphia.
Crawford, James A	Twenty-second and Greene streets	Nazareth.
Crittenden, Samuel W	Oswayo	Potter county.
Croushore, Henry G	Grapeville	Westmoreland county.
Dancy, Henry H	1339 North Fifteenth street	Philadelphia.
Davis, William	Mount Carmel	Northumberland county
Daunenhauer, Frederick	1301 Germantown avenue	Philadelphia.
Daws, William Ruth	Scranton	Lackawanna county.
Deen, Frank S	12 North Queen street	Lancaster.
DeFord, Charles H	1006 Race street	Philadelphia.
Dershimer, Harry S	Kittanning	Armstrong county.
Desmond, Edward	108 North Twelfth street	Philadelphia.
Detwiler, William Penn	2132 Ridge avenue	Philadelphia.
Dix, Carron E	3 Garfield avenue	Carbondale.
Dinough, Charles S	1015 Columbia avenue	Philadelphia.
Dunning, John	16 Wabash avenue	Pittsburg.
Eakin, Henry G	North Wales	Montgomery county.
Eberly, David A	Mechanicsburg	Cumberland county.
Elm, Paris Foster	Shippensburg	Cumberland county.
Eshbach, William W	West Bethlehem	Lehigh county.
Eyer, Edward A	108 North Market street	Bloomsburg.
Fadeley, Robert W	1020 Oxford street	Philadelphia.
Failing, John P	1631 Arch street	Philadelphia.
Finney, John J	Conshohocken	Montgomery county.
Fischer, Frederick F	2332 Frankford avenue	Philadelphia.
Frame, Wallace V	4022 Parrish street	Philadelphia.
Garver, Walter J	Eighteenth and Jefferson streets	Philadelphia.
Gebhardt, Ehrgott W	2833 Howard street	Philadelphia.
Gibson, Hiester F	2842 Ridge avenue	Philadelphia.
Greesley, William R	30 North Beaver street	York.
Gregory, Robert N	1600 Pine street	Philadelphia.
Grohmann, Edward J. C	Butler	Butler county.
Gruhler, Martin	119 W. Cherry street	Shenandoah.
Hall, John W Jr.,	807 Hepburn street	Williamsport.
Hart, Joseph A	158 W. Girard avenue	Philadelphia.
Healey, Joseph	409 S. Twenty-second street	Philadelphia.
Helm, Robert	220 Vine street	Philadelphia.
Hess, Harvey S	330 Main street	Bethlehem.
Hess, Miles R	2864 N. Fifth street	Philadelphia.
Hinkle, Samuel W	45 N. Front street	Columbia.
Hodgson, Edwin	1128 Girard street	Philadelphia.

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Hodnett, Alfred T. G	25 E. Princess street	York.
Hoelzle, William	686 Preble avenue	Allegheny.
Holtzhausser, George J	Fifth and Jefferson streets	Philadelphia.
Horting, George W	1607 Ridge avenue	Philadelphia.
Howe, Herman N	Mifflintown	Juniata county.
Huberly, John H., Jr	Latrobe	Westmoreland county.
Hull, Charles S	39 Sixth avenue	Pittsburg.
Hutchinson, Burt T	South Bethlehem	Northampton county.
Jacobs, Irwin B	Hollidaysburg	Blair county.
Jones, D. G., Jr	Minooka	Lackawanna county.
Kahle, Francis W	Franklin	Venango county.
Kearns, William	Cherry and Claymont streets	Philadelphia.
Keyes, Minor E.	Twenty-first and Mt. Vernon streets	Philadelphia.
Kirk, John H	510 W. Seventh street	Chester.
Kirk, Samuel B	1400 Spruce street	Philadelphia.
Knoop, Edward T	16 N. Thirteenth street	Philadelphia.
Kohler Charles	Mervine and Norris streets	Philadelphia.
Kramer, Jerre Ray	712 Campbell street	Williamsport.
Kretz, Edward J	82 Keating street	Pittsburg.
Kunkle, Daniel	1135 Vine street	Philadelphia.
Lamar, William R	1317 Green street	Philadelphia.
Lanctot, Henry R	1805 Park avenue	Philadelphia.
Lefever, Acton Ash.	137 N. Queen street	Lancaster.
Leh, George D	301 N. Ninth street	Philadelphia.
Lilly, Howard	2500 Jefferson street	Philadelphia.
Linn, William E	1615 S. Broad street	Philadelphia.
Lippman, Max	1607 Ridge avenue	Philadelphia.
Lloyd, Richard Louis	1606 Mt. Vernon street	Philadelphia.
Long, Howard E	101 N. Eighth street	Reading.
Lupin, Emanuel	217 Mayland street	Philadelphia.
Lynch, Daniel J	Conshocken,	Montgomery county.
MacNair, Ivey F	44 Lancaster avenue	Philadelphia.
Manko, Emanuel	Trenton	Mercer county, N. J.
McCoy, Cornelius J	Seventh street and Montgomery av	Philadelphia.
McCreight, Charles	Howard and York streets	Philadelphia.
McDonnell, Charles P	2630 E. Lehigh avenue	Philadelphia.
McKee, Edward H	2000 Penn avenue	Pittsburg.
McNeal, Harry B.	153 N. Tenth street	Philadelphia.
Meink, Frederick Wilhelm	929 Vine street	Philadelphia.
Metzger, George F	124 S. Main street	Bethlehem.
Meyer, Henry	1131 Columbia avenue	Philadelphia.
Missildine, Arthur H	Winter Park	Orange county, Fla.
Mocherman, Norman C	Poland	Mahoning county, Ohio.
Mooney, James E	3112 N. Fifteenth street	Philadelphia.
Moore, Thomas F	2316 Jane street	Pittsburg.
Murrell, Alexander H	2111 Whaton street	Philadelphia.
Mussina, Charles C	725 W. Market street	Cowan.
Mustard, Frank H	1818 N. Seventeenth street	Philadelphia.
Naugle, Frederick S	801 N. Nineteenth street	Philadelphia.
Newcomb, Cyrenius	23 Fourth avenue	Pittsburg.
Pashley, Frederick H	55 Walnut street	Bridgeton, N. J.
Paullin, George L	2407 Fairmount avenue	Philadelphia.
Pettyjohn, William Q	1316 Green street	Philadelphia.
Phillips, G. Warren	Fifteenth and Master streets	Philadelphia.
Pollak, Berthold S	2201 N. Fifth street	Philadelphia.
Poppenhausen, Henry A. C.	2801 Girard avenue	Philadelphia.
Reap, Edward A	Pittston	Luzerne county.
Regar, Wayne S	Twenty-fifth and Christian streets	Philadelphia.
Rehfuss, Jacob H	Thirteenth and Lombard streets	Philadelphia.
Remley, Charles C	250 E. King street	Lancaster.
Rickert, William McKinstry	2029 N. Twentieth street	Philadelphia.
Robinson, James D	Shippensburg	Cumberland county.

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Rothwell, Walter	1850 N. Eighteenth street	Philadelphia.
Ruete, Otto Moyer	Dubuque	Dubuque county, Iowa.
Ralbach, Louis	431 Market street	Pittsburg.
Sayboldt, George H	2205 Emerald street	Philadelphia.
Schmerker, Charles F	396 Union street	Allentown.
Schmickle, Charles F	501 S. Twenty-fourth street	Philadelphia.
Schneider, Charles	1207 Race street	Philadelphia.
Seiffert, Frank M	503 W. Market street	York.
Sellen, Edward C	2509 Fairmount avenue	Philadelphia.
Sellers, Oscar W	1019 Vine street	Philadelphia.
Shaner, James E	Greensburg	Westmoreland county.
Shimer, Miles,	1301 Market street	Philadelphia.
Sickel, William A	Bristol	Bucks county.
Sierer, John	Eighth and McKean streets	Philadelphia.
Simmons, Frank W	1755 N. Thirteenth street	Philadelphia.
Smith, Daniel Evans	720 N. Fifth street	Philadelphia.
Smith, George Lewis	Orrstown	Franklin county.
Smith, Paul	406 Market street	Sunbury.
Smyser, Willis S	153 W. York avenue	York.
Sorber, Lewis S	Franklin street and Columbia avenue	Philadelphia.
Sparks, Edgar R	2327 Broome street	Philadelphia.
Sprenger, William A	Lancaster	Lancaster county.
Sprickler, Walter S	137 N. Queen street	Lancaster.
Sprowles, Walter H	701 N. Twelfth street	Philadelphia.
Steltz, Harry S	324 Chestnut street	Pottstown.
Stengel, Arthur	2229 Spruce street	Philadelphia.
Sutton, John Dorrance	658 N. Eleventh street	Philadelphia.
Tall, Thomas A., Jr	Chester	Delaware county.
Taylor, William F	3223 Woodland avenue	Philadelphia.
Taylor, W. Clark	543 Landis avenue	Vineland, N. J.
Thompson, Benjamin S	69 W. South street	Carlisle.
Thompson, J. B	Cochranville	Chester county.
Thum, John C	2838 Girard avenue	Philadelphia.
Traub, Elmer,	Umatilla	Lake county, Fla.
Ueberroth, Harvey M	Nineteenth and Oxford streets	Philadelphia.
Umstead, Walter H	1106 Wallace street	Philadelphia.
Vogelbach, Jacob H	600 Eleventh street	Philadelphia.
Watson, Walter W	4 W. Vine street	Lancaster.
Welshons, William P	Butler	Butler county.
Westphal, Karl H	491 N. Fourth street	Philadelphia.
Whilt, John Henry	3520 Germantown avenue	Philadelphia.
Whitten, William Henry	Chestnut Hill	Philadelphia.
Wike, William J	Marietta	Lancaster county.
Wilkinson, Howard M	1423 Vine street	Philadelphia.
Williams, Mary E	Berwyn	Chester county.
Wohlgemuth, Julius	305 N. Seventeenth street	Philadelphia.
Workman, William H	1603 Vine street	Philadelphia.
Wright, Edgar U	124 Market street	Harrisburg.
Zang, Sebastian E	Hasglave avenue	Allegheny.
Zeller, Charles Adam	1705 Christian street	Philadelphia.

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